The Builder.

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London in 1868.

REGISTRAR-GENERAL, in his annual summary of the weekly returns of births and deaths in London, does well in prefacing his usual information of a sanitary and statistical nature with a few figures, which afford considerable assistance in the attempt to form an adequate idea of the present size and population of London. With all the recently-increased facilities for metropolitan locomotion, a personal knowledge of the nature and extent of the whole of London is, from its very size, a rare accomplishment. It is well, therefore, now and then, to be reminded of such facts as the following:—

The area of London is about 78,000 acres, or nearly 122 square miles. This, it should be understood, is London as defined by the Registrar-General, including Hampstead, Kentish-town, and Stoke Newington, on the north; Wandsworth, Norwood, and Sydenham, on the south; Bow, Poplar, and Greenwich, on the east; and Kensington, Hammersmith, and Fulham, on the west. On this area, including these suburbs, stand over 400,000 inhabited houses, with an average of nearly eight persons to a house, giving a mean density of 40 persons to each acre. It is now nearly eight years since the last census, and we are dependent upon estimates for forming an idea of the present population of London. The estimate based upon the rate of increase which prevailed between 1841-61, gives 3,126,635 as the number of inhabitants of this large area, to the middle of 1868. The county-rate assessment of 1866 placed the annual value of property in London at 15,261,999*l*. The influence of elevation upon human health is now pretty generally known; the Registrar-General informs us that the population of London resides at a mean elevation of 39 ft. above Trinity high-water mark. The elevation of London varies from 11 ft. below high-water in Plumstead Marshes, to 429 ft. above high-water mark in Hampstead. On the north side of the Thames, Fulham, Pimlico, Westminster, and the Isle of Dogs are below high-water mark; on the south side, Battersea, Kennington, Camberwell, Bermondsey, and Rotherhithe. After Hampstead, the most considerable elevations within the limits of London are Shooter's-hill and Sydenham-hill, respectively 411 ft. and 360 ft. above high-water mark.

In the twenty-nine years 1840–68 the average annual rate of mortality was 24·3 per 1,000 persons living; the rate varied between 21·0 and 22·1, the lowest in 1850 and 1856, and 29·4 and 30·1 in 1854 and 1849, in each of which years a cholera epidemic prevailed. The last visitation of cholera in 1866 did not raise the death-rate of England above 26·5, which may be taken as evidence that through the growth and influence of sanitary knowledge the London population was in 1866 in a better condition to repel this hitherto alarming disease. In 1868 the rate of mortality in London was 23·6, and ·7 per 1,000 below the average of twenty-nine years. In the fourteen large towns of the United Kingdom furnishing weekly returns, the aggregate death-rate in 1868 was 25·6, and two per 1,000 above the rate which prevailed in London. In these fourteen large towns the rate of mortality during the year, ranged in order from the lowest, was as follows:—

Bristol	22·8
London	23·6
Birmingham	23·9
Hull	24·4
Dublin	24·6
Newcastle-upon-Tyne	25·6
Bradford	26·5
Sheffield	26·6
Edinburgh	26·9
Leeds	27·5
Liverpool	29·2
Glasgow	30·5
Salford	30·8
Manchester	32·0

This list shows a difference of no less than 9·2 per 1,000 between the death-rates prevailing during the year in the towns occupying the first and last places. No less than 3,376 persons fell victims during the year to the excessive mortality in Manchester, who would have survived if the death-rate had not been higher than that which prevailed in Bristol. Compared with previous years, Newcastle occupies an improved position, and so does Liverpool, while Manchester and Salford appear lower in the list. Sheffield would have taken a higher place but for the epidemic of small-pox which was so fatal during the latter half of the year. The death-rate in Leeds was considerably below the average in the first six months of the year, but rose rapidly in the last few months, principally through the fatal prevalence of measles, and typhus and typhoid fevers.

In the different parts of London the death-rate during last year was 22·7 in the west districts, 22·9 in both the north and south districts, 24·7 in the central districts, and highest, 25·6 per 1,000 in the east districts. The excessive rate in the east districts must not be attributed to the distress which there prevailed during the greater portion of the year, as the average death-rate in that portion of London (including Shoreditch, Bethnal-green, Whitechapel, St. George-in-the-East, Stepney, Mile-end Old Town, Bow, and Poplar) the death-rate in the twenty-nine years—1840-68—averaged 26·0 per 1,000, or slightly above the rate in 1868, as was the average rate in the same period for the whole of London. The Registrar-General shows that sanitary improvement has been most striking in South London, where, previously to 1856, the sewerage was especially defective, and the water supply drawn direct from the Thames, was heavily charged with sewage. During the five years, 1840-4, the death-rate in South London was 25 per 1,000, in 1845-9 it was 28, in 1850-4 it was 26, in 1855-9 it further fell to 23, in 1860-4 it was again 23, and in 1865-8 it ranged from 22 to 24. During the cholera epidemics of 1849, 1854, and 1866 the death-rate in this part of London, from all causes, was 38, 35, and 34 respectively. The mortality is now lower in South London than in North London.

The causes of death in London in 1868 do not present many remarkable features: we shall therefore confine ourselves to a brief notice of three classes of death,—those resulting from zymotic disease, those referred to affections of the respiratory organs, and to violent deaths. Of the 74,908 deaths which were registered in London during the fifty-three weeks of last year, 18,893 were referred to all diseases of a zymotic character, showing a proportion of 25·2 per cent. of the total deaths, against 21·3 in 1867, and 29·6 in 1866, when cholera was epidemic. The mortality from this class of diseases is in a great measure governed by the degree of fatality from infantile diarrhœa during the summer and early autumn; in 1860, when the summer season was remarkably cold and wet, both the death-rate in the year from all causes and the proportion of fatal cases of zymotic disease were lower than in any of the past ten years. Small-pox, last year, was considerably less fatal than in recent years; while the deaths from scarlatina and diphtheria were decidedly more numerous, and those from whooping-cough and measles nearly corresponded with the average of previous years. The various forms of fever (including typhus, typhoid, enteric, and simple) caused 2,483 deaths, which, although showing a small increase upon 1867, were considerably lower than in any of the preceding five years. During the year no less than 4,060 deaths resulted from diarrhœa, of which 3,145 occurred in the three months ending September 30th; in the year 1860, above alluded to, only 1,383 deaths were referred to diarrhœa; and in the thirteen years, 1856-67, the highest number of deaths so caused was 3,557 in 1865. The unusual heat, combined with the remarkable drought of last summer, caused the excessive mortality from diarrhœa, principally infantile, which then prevailed.

Diseases of the respiratory organs, including phthisis, caused 21,203 deaths, or 28·3 per cent. of those from all causes. The heat of last summer scarcely affected the mortality from this class of diseases, and the unusual mildness of January, February, November, and December, was especially favourable to those affections, particularly to bronchitis, pneumonia, and others of an inflammatory nature. We might, therefore, have expected to find the mortality from the diseases of these organs unusually low; this, however, was not the case, although they were below the numbers returned in any of the four years, 1864-7. In 1859 only 16,975 deaths, or 27·5 per cent. of the total deaths, resulted from these diseases. The mean temperature of the air in 1868 was 51·6°, and 2·3° in excess of the average temperature in the 29 years, 1840-68, it also exceeded the average of any one of those years, the nearest approach to it being 51·3° in 1846. The dryness of the atmosphere was 6·8, the average of 29 years being 5·6. The rain-fall of the year was 25·2 inches, against an average of 24·3 inches; the deficiency during the summer being more than compensated by the heavy rains of January and December. The mean daily amount of horizontal movement of the air in the year was 293 miles, whereas the average during the 20 years, 1849-68, was only 247. The full effect of these meteorological conditions upon human health, and especially upon the respiratory organs, is at present scarcely sufficiently understood.

The statement that 2,567 deaths in London last year resulted from external causes, and were what are called "violent deaths," is somewhat startling, and yet such was the case. Of every 1,000 deaths during the year no less than thirty-four were cases of accident or negligence, homicide, suicide, or execution. It is worthy of remark that this class of deaths has steadily increased, with but slight fluctuations, from 1,839 in 1856, to the 2,567 during 1868. Such a waste of life from causes most decidedly within human control, does not reflect much credit upon the humanity of this nineteenth century. While advocating and encouraging sanitary efforts of all kinds, we must not forget to enforce measures for the safety of life and limb from violence; for this, however, we must the rather look to the Commissioner of Police, than to the Privy Council and to health officers. Of the 2,567 violent deaths in London last year, 2,126 resulted from accident and negligence, 112 from murder and manslaughter, 294 were suicides, and two executions. Among the accidents, 891 were caused by fractures, contusions, and wounds, 287 by burns and scalds, forty-four by poisoning, 339 by drowning, 386 (principally of infants) by suffocation, and in the other 179 the causes were imperfectly returned. Of the suicides, sixteen chose gunshot, fifty wounds by cutting or

stabbing, forty-six poisoning, seventy-two drowning, seventy-nine hanging, and in thirty-one the mode of suicides were not stated. The proportion of these violent deaths, it may be observed, is generally considerably smaller in London, indeed in most large cities and boroughs, than in the country at large; this may be accounted for in two ways;—first, by the superior intelligence of town inhabitants, as so large a number of these accidents result from careless ignorance; and secondly, by the superior, and more easily accessible, hospital accommodation in large towns.

The 74,908 deaths last year in London included 12,326, or 16·5 per cent., which occurred in the public institutions; of these 6,789 were registered in workhouses, 4,647 in hospitals, 336 in lunatic asylums, 75 in prisons, and the remaining 479 in other asylums and special institutions. There has been a continuous increase in this class of deaths since 1859, when only 9,633, or 15·3 per cent. of the total deaths, were so recorded. It is scarcely necessary to say that the proportion of these deaths is much larger in London than in other large towns in England.

The Registrar-General naturally deals in his report, at some detail, with the condition of the sewerage, and of the water supply of London in 1868. No one can well over-estimate the importance of these two subjects, or their direct influence upon the public health. We can, however, only, in concluding our notice of this important annual return, just touch upon these two points.

The main drainage system of sewerage for London is approaching completion, but not until it is complete can we judge of its full effect upon the river, and its influence on the health of London. The most important parts of the "low level sewer are not yet constructed; namely, the part from Chelsea Hospital, including the first lift down to Westminster Bridge, and the part extending from the Temple to the Tower of London; so that many of the large sewers still pour their contents into the Thames." Consideration of this apparently probable purification of the Thames, at no very future date, from contamination of the sewage of London, at the actual outlay of millions of pounds, which have still further raised the already heavy tax burthens of London householders, is somewhat embittered by the knowledge that the result of this gigantic undertaking runs the risk of being in a great measure neutralized through the use of the river by Oxford, Reading, Windsor, Richmond, and other places above London, for the evacuation of their sewage. From another point of view this state of things appears still more fatal. Many years ago Parliament enacted that the London water companies should take their supply from above London, and beyond the reach of the contamination of London sewage. Each of the past few years has shown an increasing contamination of the Thames from the sewage of towns up the river. The public naturally looks anxiously for the long-delayed report of the Royal Commission appointed some years since to inquire into the whole subject. Even Dr. Letheby will have some difficulty in persuading the London water-consumers to consider themselves satisfactorily treated by the present water companies, either in quantity or quality.

The year 1868 was, it must be allowed, most unfavourable for the water supply of London, drawn as it is from a tidal river. The heavy rains of January, October, and December, caused the river to become turbid,—a result observed on many occasions in water drawn from the mains; the long drought of June, July, and August was moreover detrimental alike to the companies and to the consumers. Notwithstanding these circumstances, it is, however, satisfactory to be assured by so high an authority as Dr. Frankland, in his official report to the Registrar-General, that, probably from greater attention to and improved methods of filtration, the sewage contamination in the water supplied by all the London water companies (except the Kent) showed a reduction in 1868 upon 1867. The condition of the water supplied on many occasions during 1868 is reported by the same authority, however, to have been such as to render it totally unfit for domestic use. Chelsea, Southwark, and Lambeth were the principal offending companies, while the West Middlesex is said to stand pre-eminent as regards careful filtration, a matter of such vital importance, considering the source, and quality of the water used. The discovery of an excessive proportion of common salt in the Southwark water in the autumn, at the latter end of the drought, suggested a suspicion of the admission to the company's reservoirs at Battersea of a proportion of tidal water. The possibility of such a thing, with the intimate relation which was proved between the outbreak of cholera and the East London water supply in 1866, fresh in our memory, is sufficiently alarming. Dr. Frankland furnishes a table showing, from analysis, the total impurity contained by waters drawn from the supply of several provincial towns, and compared with that of London. In 100,000 parts of each water, the "total solid impurity" of the London waters varied from 26·9 in the New River, to 45·3 in the Kent; while in Glasgow, supplied from Loch Katrine, it was only 3·0; in Lancaster, from Bleasdale Fells, 4·6; in Manchester, from Derbyshire hills, 6·2; in Keswick, from Skiddaw, 4·3; and in Whitehaven, from Ennerdale Lake, only 2·2. In each of the latter cases, "previous sewage or manure contamination" was *nil*, while in the London waters it varied from 1590 to 3842. Comment is unnecessary.

We must, while acknowledging the many satisfactory evidences of sanitary progress in London, and other large towns, in 1868, trust, and not without reasonable cause, for still more favourable results from continued and energetic efforts in the same direction during 1869, and the next few years.

THE CONFLICT OF METROPOLITAN AUTHORITIES AS TO ARCHITECTURAL IMPROVEMENTS.

IT is now some eight centuries since the charter of the Norman Conqueror encouraged the citizens of London to form a sort of happy family on a large scale, or a little *imperium in imperio*. The first fruits of the original "social compact" are still existing, in the form of a corporation. But the difficult and anomalous part of the thing is, that this corporation does not now fulfil the originally prescribed conditions. It is not sole—it is not supreme. It has come, in the course of time, to be surrounded, encroached upon, and over-shadowed, by other corporate bodies, under various names. Of these the most general, and perhaps the most formidable, is the name BOARD. Under the direction of various Boards, or compound individualities, the independence of the primary unit, the citizen householder, has been altogether obliterated. He has nothing which he can call permanently his own. Not his house, which is liable to be "scheduled," or expropriated. Not his business, which may be destroyed by the same method, or by turning the traffic of a large thoroughfare from his door, or by a dozen other procedures, emanating from an equal number of Boards. We find Gas Corporations, Water Corporations, Railway Corporations, Paving Commissioners, Poor-law Commissioners, Police Commissioners, Board of Works, and district Boards of Works, all living, and apparently thriving, and certainly acting with the most absolute disregard of one another. They will not part with an iota of their independence, even for the sake of saving money. Why, indeed, should they? The money does not come out of their pockets. There are the police rate, the poor rate, the county rate, the rate of the Metropolitan Board of Works, and the new Metropolitan Asylums rate.

There is scarcely a resident householder of London who is not painfully aware of the truth of this description. Most of them know it to their cost,—their cost in time and in convenience, no less than in actual money. But even the latter item is no trifle. Suppose a certain great thoroughfare to be out of order, and that, after a proper amount of discussion, the "board" that presides over the spot has taken the matter in hand, and made good the road at the expense of 250*l.*; the removal of the implements of the servants of this board, which we will call No. 1, is the signal awaited by the servants of the board No. 2. They proceed to fix posts and rails in the newly-finished roadway, to re-open it from end to end, and to re-adjust the gas-main, which had begun to emit very sensible tokens of having been disturbed by the operations of board No. 1. A long trench, heaped over, when at last it is refilled, like a grave, only with the clay bank interspersed with road-metal, now divides the up and down traffic on the road, or would divide it if the traffic kept to its own side, as it is now becoming accustomed to do. But just about the time when the action of wheels and of hoofs has nearly levelled this prolonged stumbling-block, the oozy state of the mixture attracts the notice of board No. 3. The waterworks people see that the precious element is escaping, *their* mains having been in their turn disturbed by preceding operations. Then comes a repetiton of the proceedings of board No. 2. By the time that traffic is again allowed to adjust itself to the roadway, the season is so far advanced that the sewer authorities think it high time to perform a little work of their own in the same locality, and destruction No. 4 takes place accordingly. Now if the first proceeding was rightly priced at 250*l.*, we cannot allow a much smaller sum for either of the subsequent operations. We shall have, after six or eight months of interrupted traffic, a very bad road, which has cost the ratepayers, or the gas-consumers, or the water-consumers, or some taxable party, 1,000*l.*, while, by the mere expedient of combination, the work might have been done in two months for 400*l.* And if the only rational provision for laying mains, whether for water, or for gas, as well as for maintaining the sewers and protecting the wires of the electric telegraph,—the subway, had been adopted in the first instance, the original 250*l.* would have covered the entire outlay for maintenance for some two or three years.

In all this, our readers may think, there is unfortunately nothing very new. It was much the same ten or fifteen years ago. It is unpleasant, but it appears to be our normal condition.

But the pressure increases, year by year, with the growth of our vast metropolitan population. And not only does the pressure of old grievances increase, but, year after year, new grievances swell the list. The piercing, and burrowing, and arching, through London, proceeds with rapid pace. New streets suddenly open, like dissolving views, through ancient lines of frontage. Transformations, like those of a pantomime, occur so unexpectedly, that the oldest inhabitant, if confined to his bed for a twelvemonth, would wonder where he was when he next went out for an airing. And, over-topping all other boards and corporations by a head and shoulders, stands, or rather moves, the gigantic figure of the Board of Works.

Now, not only have these numerous corporate entities entirely failed as yet to establish the "social compact" among themselves, but they act with a sturdy independence of one another, which has much the same result as the most lively hostility; and they act very vigorously, moreover. The result is, that some anomaly, or inconvenience, or absurdity is constantly threatening us, and nobody is to blame. Every one is right, within their own powers and limits, and from their own point of view. But as there is no combining or controlling agency, nothing to prevent the very admirable plan of Board No. 1, from coming into the most hopeless collision with the very admirable plan of Board No. 2, the Londoners are getting rather the worst of it.

"When things are at the worst, they sometimes mend." That we have arrived at this hopeful point we dare not assert; but it is at least something, that not only men interested in the architectural beauty of the metropolis, but actually some of the presiding genii of the conflicting Boards, have been driven, in their despair, to apply for the aid of the House of Commons, in the hope that that which made can unmake, at least a portion of the confusion.

For the marvel is, that nothing but new, *ad hoc*, legislation can avert a mischief which every one deprecates, and which no one advocates. Yet it will wreak itself, unless legislatively stopped. It is some frightful Frankenstein, which the House of Commons has called to life, why, how, and whence, no one seems to know. The Board of Works feel themselves bound to expend a quarter of a million sterling, which they have not by them, and which they do not know how to obtain, in the construction of a viaduct, which no one wishes to be built, which seems more likely to be an obstruction than a convenience to traffic, which would form an intolerable eyesore on one of the best architectural sites in the world, and which would destroy the saleable character of eight acres of land, reclaimed at great expense from the Thames, and which may be estimated as likely to fetch, if sold, at the very least 20,000*l.* per acre.

The whole affair appears to be all but incredible. The First Commissioner of Works says that he "really has nothing officially to do with the Thames Embankment, or with anything which might be erected on that great high-

way." The chairman of the Metropolitan Board of Works, and the Board itself, "are as much opposed to the making of the road" as is the helpless First Commissioner himself, who adds that he feels "assured that they, *i. e.*, the Board of Works, would do all they could to put a stop to its construction." The District Board of Works "had never been consulted on the subject, and had petitioned against the work as soon as its true character became known." The vestry of St. James presented a petition to the House of Commons "declaring the proposed structure unsightly and of questionable utility for purposes of traffic." The owners of Salisbury-street and Cecil-street had power given to them by the Act authorising this undesired structure to put up gates, which would intercept the communication with the Strand. The only speaker who made the slightest attempt to defend the scheme, merely made matters worse, by saying that "his chief object in rising was to show that the whole of the proceedings in the matter had been of a most deliberate character." An expensive, unsightly, unnecessary, ill-adapted structure has obtained a legislative right to exist: no one knows why, or how, or when, in spite of the ill-will and opposition of every one. Such, at least, is the opinion of five gentlemen, each very competent to form a judgment, as expressed by them in the House of Commons on the 22nd of February.

The House has, very naturally, appointed a committee to investigate the subject, and we suppose there is little doubt that the legislation of 1869 will, in this respect, reverse the legislation of 1868. But what a ponderous, inefficient, haphazard mode of dealing with an important national question is this! How strongly does it tend to support the arguments of those who, either in or out of the House of Commons, urge the propriety of the appointment of some officer of the nature of an ædile,—of some central, combining, impartial, permanent authority, to watch over the architectural welfare of the metropolis. A minister of public works holds the rank of a secretary of State in every European country of the first rank, except our own. Our "First Commissioner," who (Mr. Beresford Hope tells us) constantly sees his name in foreign journals as *le Ministre des Travaux publics*, "has no more authority over public buildings than the beadle in Burlington Arcade." The ultimate authority, Parliament, supposing it to discard for once all party or personal motives, and to look at any project brought before it for authorisation solely on its merits, is placed in a most false and unfair position; for the merits of a part may be great, if the part alone is considered, although they may form the demerits of the whole. But at a general, comprehensive view of the bearing of any suggested alterations on the architectural or æsthetic unity of London, how would it be possible for the House, or a committee of the House, to arrive? It is the very highest effort, not only of the skill but of the genius, of the architect or of the engineer, to grasp the true principles of such a unity. How far, how very far, the designers of some of our modern works,—grand enough, it may be, in themselves,—are from estimating the effect they would produce, situated and surrounded as they are, we have ample proof. We may look at the two enormous wagon-roofed stations of Charing-cross and Cannon-street, as perhaps the most striking examples of what we mean. There can be no doubt that these are very skilful structures; triumphs of the talent of the engineer. To a spectator, under either of these roofs, the effect is extremely imposing, and the iron firmament above his head soars skywards with a dignity which tends to dwarf the crowd on the spacious platforms. But none the less do we believe these roofs to be mistakes. A more modest rise, and a division of the entire span into three, would have reduced the cost of the roofing by a considerable amount, and would have been, in every conceivable respect, as convenient for the working of the line. The great risk of damage by fire (already experienced), or by violent storms, would also have been reduced. These, however, it may be replied, are questions for the company alone, to settle with their own professional advisers. Just so. But when we consider that by going to an unnecessarily lavish expense, in the uprearing of a disproportionately large roof, a great injury has been inflicted on the architectural character of the vicinity, it is clear that some one besides the company and their advisers ought to have had a word to say on the subject. Let any one differ as much as he likes from our opinion that the inner or under view of each roof would have been more picturesque, while the structure would have been far cheaper and safer, if built in three spans instead of in one enormous semicircle, there is no room for dispute as to the effect of the outside of these structures. It is simply and unmitigatedly hideous. The proportion is such as even to destroy the sole inherent quality of great bulk—majesty. Who could call these large Noah's arks majestic? Ugly in themselves, they hopelessly dwarf and curb any building that comes near their standard. St. Paul's itself is obscured, from great part of London Bridge, by the unsightly block at Cannon-street. Nor, so long as these roofs stand in their present awkward magnitude, can the noble edifices that line, and that are intended to line, the magnificent esplanade rescued from the bed of the Thames, produce their proper architectural effect on the eye of the tasteful observer.

The intolerable confusion caused by the endless subdivision of responsibility and of authority is forcing the introduction of remedial measures. But they are only attempted bit by bit. It has not yet become clear how far any individual remedy may ultimately affect the general malady. The whimsical variety of rating, by which, according to the present system, house property in the metropolis is assessed at a different value, not only in every union, and in each non-united parish, but by each of the five or six rating authorities, whose collectors make their quarterly demands on the unlucky owners or occupiers, is one of those instances of hopeless jumble. So entirely indefensible is the state of affairs, that now that attention has once been clearly called to the subject, the Government finds itself compelled to confess the duty of providing a remedy. And it is more satisfactory to expect this remedy at the hands of the administration, than to look for it from the motion of any individual member, however much the ratepayers and householders of London may have cause to feel grateful to the honourable Baronet, who has obtained the recognition of the necessity.

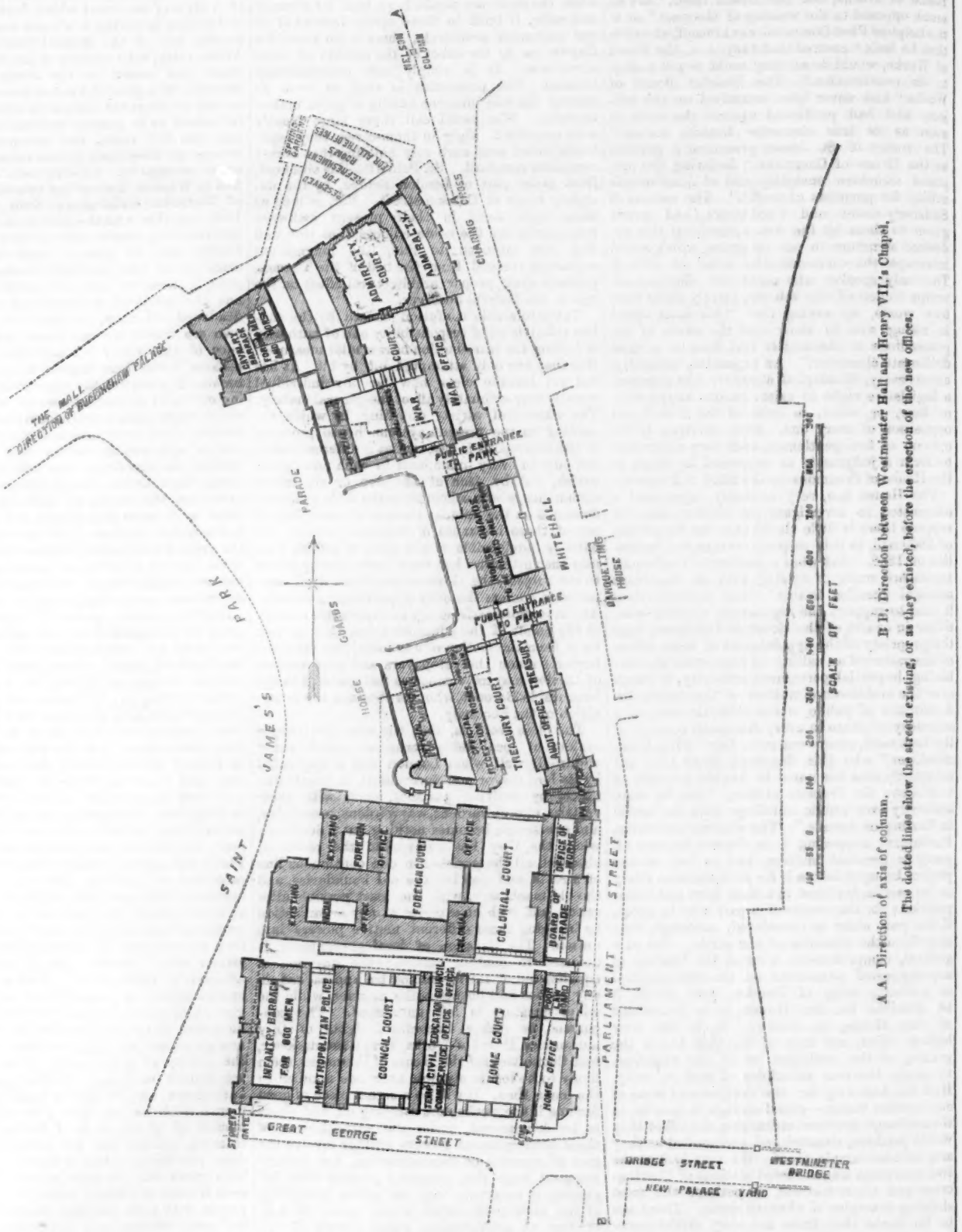
The plain truth is, that the wise and simple system of local self-government which acted admirably well when London was a city ruled by its lord mayor and surrounded, at gentle distance, by outlying parishes, each with their vestries, churchwardens, way wardens, constables, and overseers; becomes nothing but a dead-lock when the City has overspread the province, absorbed all the parishes in one continuous line of streets, and yet left the old boundaries, and the old machinery, with the least possible alteration, and with no attempt at any organization by bringing these different motive powers into unison. The question of local government is deferred to another session; the question of equalization of rating cannot be approached, in any serious and business-like manner, while the wider question is left untouched. The concurrent, or rather discordant, rights of City authorities, Board of Works, First Commissioner, and Committees of the House of Commons, seem likely to be left to stumble over one another in the mean time. It will be a signal piece of good fortune if the works now carrying on, and about to be commenced, under the authorization of these heterogeneous powers, neither involve the cost of removal or reconstruction, nor destroy the good hope that sanguine persons were beginning to entertain, that the active rebuilding of the metropolis which is now going on may produce an architectural result worthy of the wealth of the largest capital in Europe, and the picturesque site which that capital occupies by the curving banks of the Thames.

THE RELATION OF SCIENCE TO ART.

AT the annual distribution of prizes to the pupils of the Cirencester School of Art, last week, Professor Church made an address, in the course of which he said:—I will take up as they come into my mind a few subjects of artistic moment about which I have often thought. First among these stands the relation of science to art—its help and its interference more particularly being in my view just now. It has often happened that the period in a nation's history when art has attained its greatest perfection has not been distinguished for special moral excellence, or large literary achievement. Chinese colour is most lovely, its combinations and modes of application afford splendid examples of refinement of taste, yet the sterotyped character of Chinese civilization is a by-word in Europe. In North Africa, again, we have several rough and half-civilized tribes possessed of a style of ornament which, both as to design and colour, is worthy, I will not say of imitation merely, but of the deepest study. A bit of Arabic inlay, such as some of the Meymar specimens just added to the South Kensington Museum, or a plate of Persian faience, will show us that we must not disdain to learn from people far behind us in general civilization, who knew less, but felt more, and commonly achieved, in some art directions, greater successes than are usual amongst us. Looking back 300 years, we find in Western Europe the splendid structures of Mediæval architecture, from A.D. 1200 to 1500, together with the perfect products of many kindred arts, coeval with a state of society, of feeling, and of general knowledge which in some points was absolutely barbaric. Was it, then, I want to ask, the growth of science and the spirit of philosophical inquiry which deadened art then, or must we look to our own era before we can trace any great influence of this kind? I ask this question not because I can here answer it completely, but because it gives me the opportunity of mentioning one point of contact between science and art which leads often, in individual cases, to distinct failure. You know that men of science, who are always questioning nature and learning her secrets, can now do, at their will, and more perfectly than before, many things which men knew not the reason of formerly, and which came as it were hap-hazard, and now and then to the earlier workers. Take an example. When the great French potter, Bernard Palissy, was at work (he died in 1590), no knowledge of the real nature and affinities of the materials of pottery, its colours and glazes, was to be got. He struggled through years of experiments and years of disappointment, and achieved at last a success of no inconsiderable sort. During the last hundred years or more every problem that puzzled Palissy in glazing his ware has been solved by science. Invention and processes and improvements may even have been too abundant. Our manufacturers and those of Europe have done great things: but the ware may be perfect in texture and durability, the colours may be pure and bright as those of flowers, the glaze may have the polish of a jewel, but if there be lacking the artistic spirit to imbue the exquisitely prepared body with true life, the finest porcelain-paste, and enamels, and glazes are worse than dead. Those old potters whose works are now-a-days preserved as precious, did not invent their materials first, and then begin to think of design and colour: the idea of the form and the ornament had wrought itself into order, and then were sought by long-continued trials materials which should give it substance and adequately represent it. Now a chemist, or experimentor, or manufacturer invents a new glaze, and must needs daub it over everything—he makes the vessels to show off the wonderful new glaze, and not the glaze that it may enhance the beauty of the vessels. (See, as example, the Belleek porcelain.) Science has brightened our colours, too, but lay on bright chemical pigments thick as you can, glaze them with the juiciest of glazes, and, if feeling and art be wanting, science has not advantaged you, but done you harm. Most modern majolica with its hues gives you no satisfaction after you have seen it once or twice; while of the old Italian pieces, with their subdued harmonies of, it may be, poor colours, you never tire. In Josiah Wedgwood you have an illustrious example of a man who pressed into the service of his manufacture all the resources of science, and yet so used them that they served only to exalt the artistic merit of his productions. For to Wedgwood's wares chemistry gave the right composition, while mechanical skill gave truth and perfection of texture and form. By countless trials under scientific guidance Wedgwood improved his materials, not to display them as such, but in order worthily to represent the lovely designs of Flaxman, and to reproduce the beauty of antique art. I have given you illustrations of the way in which science may help or endanger art; hundreds might be cited from painting or from architecture, where especially, mathematical precision and mechanical hardness are often quite fatal to beauty of effect; but I must rest content with having directed your thoughts to a question of such great importance as the right attitude of science to art. 2. I am naturally led to say a few words now on another topic, intimately connected with the last. We have seen or may infer that improvements in manufacture arising

PLAN FOR THE PUBLIC OFFICES, LONDON.

Modified from that by Lieut.-Col. Clarke, R.E.



from increased knowledge of the intimate properties of the materials used, may often aid and often damage art. If, for example, you make all your pigments pure and bright, you may have no repose as the result—what we may name temperance of colour may become impossible or difficult. Use but do not lavish the gifts that scientific progress offers. Take a Persian dish as an example. On a white ground is a beautiful arabesque of conventional ornaments from leaves and flowers. The designer used four colours only, a pale greenish blue, like the turquoise; a deep rich blue; a grey-like Indian ink; and, lastly, a red—a peculiar tint—very dull and very dirty, not quite unlike that of a halfpenny stick of very bad sealing-wax, or a poor sort of red lead. But this colour must not be brightened: only let a scientific man come in and suggest and substitute the last new chemical red; let him take the dulness out of the red, and the beauty is taken out of the whole combination of colour. And then the Indian ink colour, a smoke colour, is on these Persian plates for a similar reason. Often their borders have, besides ornaments in colour, hundreds of little spiral curls of grey, giving at once quietness and solidity to the edge or frame, and thus brightening the central design of the piece. Temperance in colour does not indeed mean dulness and dowdiness of colour: it means proper relief, combination, and modification of colour. Let some of those rarer tints be introduced among your blues and reds and yellows, which you cannot exactly name, but which the watchful student of nature may see trembling on the leaves of the willow, or paving the autumn paths of the forest, or shining at sundown from the depths of the sky.

ON THE ARRANGEMENT OF THE PUBLIC OFFICES, LONDON.

THE construction, or rather the completion, as it should be called, of the buildings for the Public Offices of the Government of Great Britain is one of the most important architectural works that has occurred in this country in modern times. They will occupy one of the finest sites in the metropolis, and will be the architectural incarnation of the executive power of the empire, the very seat of government. They may be made to realize, on a grander scale even than the original, Inigo Jones's dream of the palace of the king of England, in so much as the empire of Victoria is greater than that of Charles.

It is somewhat remarkable that the prospect of so great a work should have roused so little action in the educated or even in the art commu-

nity of the kingdom. With the exception of the fiscal discussions of these questions in Parliament, and the somewhat meagre Blue Book we now propose to examine, there has been a notable absence of that ventilating process we pride ourselves so much on in England. Yet it is not from want of interest in the subject itself, for in our country the traffic of the public at large with the offices of Government is so general, that every class of the community has an interest in the matter; they are public offices in the fullest sense. Nor is it because it is only a professional question, for we see that when roused to it, the public does not hesitate to discuss the much deeper professional subject of guns and armour-plating; and the building profession is one particularly congenial to the Anglo-Saxon mind.

The report of a royal commission to inquire into the question of the accommodation of public departments, seems to offer a legitimate opening to the public, to try and learn something about this matter which interests them so much, and to see if they cannot form some idea of what is wanted, and how it can be most satisfactorily provided, notwithstanding the high art mysteries of the subject.

The report itself will not, it is to be feared, give the public much assistance in that way, for it is as slight and crude an affair as probably ever emanated from a royal commission; but, at all events, it affords several starting-points, and a general groundwork for discussion of the subject.

The problem put before the royal commission was not a very suitable one to be dealt with by such a body of counsellors: given a certain number of great departments of State, requiring respectively certain areas of ground for their accommodation,—to fit them all into a site already partly occupied by them, and in a manner which shall combine what Mr. Fergusson would style the three great qualities of the technic, the æsthetic, and the phonetic, in the highest possible degree; or what the uninitiated would style making them as useful and as ornamental as possible. It is a problem that can only be satisfactorily worked out by one master mind; and, therefore, when, having thus given the ingredients to make a certain dish, we find them put into the hands of half a dozen *chefs de cuisine*, it does not require the evidence of a Blue Book to enable us to foretell the result. The ingredients are of course worked up into six independent dishes, each admirable in itself, but each containing the particular idiosyncrasy *de cuisine* of its *chef*. No wonder the unfortunate professional umpire who was called in to taste each of these compounds found himself embarrassed to express his sentiments. It was impossible that so great an architect could be thoroughly satisfied with any plans so concocted; and the Government will have done wisely, if, as is understood, they have put the whole matter entirely into his hands.

That, however, need not prevent a general discussion of the question; indeed, such discussion can hardly fail to assist the architect in some degree; especially as the commissioners managed to involve it in a most curiously complicated knot.

Each member seems to have come with a plan ready made in his own mind, and his aim in taking the evidence seems to have been very much directed to inducing the witness to commit himself in favour of his plan; and the manner of taking the evidence was more suited to a private discussion of the subject between two associates than to a formal inquiry, which, with its evidence, was to form a collection of raw material at some future day to be reduced to order and bear fruit. The evidence of great statesmen and architects upon such a question might be most valuable to all succeeding generations of architects; but of what use could it be to ask Mr. G. G. Scott whether he did not think it desirable to remove existing public buildings which are inconvenient in themselves and architecturally ineffective? And when Mr. Scott naturally gives a somewhat evasive answer to such a thrust, he is doubled upon immediately by the counter thrust,—If, then, you would remove the Horse Guards, where would you put it? and feeling compelled to say something to this, he is further jammed into a corner by,—If you put the Horse Guards there, and the Foot Guards here, what will become of the Horse Marines? The Ordnance map of that part of London was, in fact, a kind of chessboard before the commissioners, with the public offices for pieces, and the commissioners on one side and the witness under examination on the other; each commissioner playing in turn, and being expected to give check to the witness in three moves.

And what benefit to posterity could it be to know that Sir John Pakington prefers the blue site to the red site? It was probably expected to be a puzzling question to a minister who had just left the Admiralty for the War-office. Sir John showed, however, that he quite appreciated the respective merits of the quarters in question; he stuck to his colours, indeed he may be said to have nailed them to the mast.

The matter contained in the report and evidence—when one does get at it—is not very satisfactory; it reminds one rather of a case of special pleading in a court of justice than of the deliberate wisdom of the counsellors of the nation. There is too much of leading questions put to advocate a foregone opinion, and very little extraction of the real opinion of the witnesses upon the whole question. One salient idea seems to have been, that it is a matter of vital importance to the empire that, when the Minister of War wishes to speak to the Commander-in-Chief he should not be obliged to put on his hat. Probably either of those great persons would think twice about traversing several public streets to ask a question of the other, but neither of them would hesitate about crossing St. James's Park for the purpose. It is not the distance that makes the difficulty of communication between offices, but the impediments in the way. A public street between two offices is like a river between two towns; and a flight of stairs is like a mountain barrier between two countries. A mysterious importance seems to be attached to the idea of being under the same roof; but it would be quite possible to put all the buildings between Charing-cross and Great George-street under the same roof, and yet the facility of intercommunication might be less than it is now.

Another leading idea in the mind of at least one of the commissioners was that the public offices should be as near to the Houses of Parliament as possible; one would suppose, indeed, from the evidence that the perfect ideal of an arrangement of public departments was a great square with the House of Commons in the centre and the offices all round the sides; so that the Speaker sitting in his chair might, by a radiating system of telegraphs, call up any Secretary of State to answer a question put in the House, before the hon. member putting it had resumed his seat. Whether it is beneficial for the general interests of the empire that ministers of State should devote so much of their energies to answering questions in the House of Commons is not for an architect to consider; but, taking the practice as it stands, there seems to be no reasonable necessity for placing any of the offices nearer the Houses of Parliament than a distance that can be conveniently walked in about a quarter of an hour,—or about three-quarters of a mile; so that a minister of State can be quite sure of being in his place in Parliament within that time from his office. What is of much greater importance to the minister is that he should be able to walk that distance with his hands full of papers, and his head full of facts, without interruption. To insist on any closer communication than that is only sacrificing the general interests of the departmental offices to one particular theory of their duties. And to press for it, especially for the department of the army and navy, the two departments of the State which should be most free from Parliamentary interference in their details, looks more like a crotchet than a principle.

Indeed, from the site selected for those two departmental offices near the Thames Embankment, it looks as if there was an idea of giving the First Lord of the Admiralty and the Secretary for War a little practical experience in campaigning, by enabling them every time they went to the Houses of Parliament to execute a sort of combined naval and military operation, by first making a flank march along the underground railway, and then taking a penny boat to the river front of the Houses of Parliament.

Now, let us examine this problem that was put before the Commission in an architectural point of view; not in the small ornamental sense of that term, but as an Italian architect, engineer, and patriotic citizen of the fifteenth century would have viewed it.

The first data we have to bear in mind are that there are certain public buildings already existing on and about the sites which it is desirable to maintain. Inigo Jones's Banqueting House at Whitehall is one, about which there is no dispute. The Horse Guards is another, about which there appear to be conflicting opinions. Some persons appear to consider it as too insignificant in character to be worth preserving; others, among whom must be placed Mr. Scott, think it quite worthy of preservation and improvement, both from its intrinsic merits and its historic interest. When there is a doubt about the destruction of a public institution the instincts of the British public generally go in favour of preserving it. Compared with its new neighbour, the palatial Foreign Office, it certainly might be considered insignificant in its present condition; but, as Mr. Scott observes, it has a picturesque character about it; the Florentine style in which it is built is one of the most suitable of the modern styles for England, and it is a fair specimen of the handsome simplicity of that style. If the square on its west side had been completed according to Kent's original design, there would probably have been no doubt about retaining it. There is, however, this difficulty about preserving it, that, from its character and position, it should form the central feature of the whole block of public offices; and for that it is hardly fit in its present condition. Mr. Scott seems to doubt whether it is capable of much improvement; but, with great respect for so high an authority, we venture to think that another story can be very suitably added to it, and that with other additions, and by completing the two sides of the square on the west, it can be formed into a very fitting centre for the seat of Government of Great Britain.

The other buildings it is desirable to retain are, of course, the new Foreign and India Offices, and, if practicable, the block called the Treasury Buildings, about which, however, there is considerable doubt, as it was not planned with much thought for further extension; and, finally, the Admiralty, a building which nobody seems to feel justified in pulling down, and yet which nobody wishes to keep. Beyond these there appear to be no other building on the St. James's Park side of the site, which it is at all important to retain if their sites should be required for public offices. On the river side of the site there are, between Northumberland House and Bridge-street, some private buildings of sufficient importance to make it worth while to retain them; but, as they do not come within the area of any one of the present projects, it is unnecessary to consider them.

Bearing these reserved buildings in mind, the first point for discussion is whether the offices shall be massed in one continuous block on the Park side, or whether they shall be concentrated more towards the Westminster end, and placed partly on the Park side, and partly on the river side of the site.

To have a clear idea of the bearings of this question, it must be recollected that Whitehall and Parliament-street form a great highway of traffic between Westminster and London, a traffic which is likely to be increased rather than diminished by the opening of the Underground Railway and the Thames Embankment; and, further, that it appears to be agreed upon all sides, that it is desirable to keep this highway open as it is, and, in fact, to improve it by forming a broad handsome road of it the whole way from Charing-cross to Westminster. This road lies, roughly speaking, north and south; on the west side of it is a site extending from Spring Gardens to Great George-street, occupied chiefly by the existing public offices, and looking on to the Park at the back; on the east side of it, from Northumberland House to Bridge-street, is a site occupied chiefly by private buildings, and looking on to the Thames Embankment at the back.

It may be assumed as impossible to place the whole of the public offices on the eastern or river side, on account of those existing on the other side, which it is desired to retain; therefore there are only the two projects above mentioned that are practicable.

The arguments in favour of the second or divided project are,—

1st. That it is economical, from its requiring a less expensive site, and especially if combined with the idea of a double instead of a single Parliament-street.

2nd. It concentrates the offices nearer to the Houses of Parliament.

3rd. It forms a noble architectural approach to Westminster.

It is on this last point that we must beg to differ strongly from the opinions expressed in the evidence in favour of it. A row of handsome public buildings on each side of a fine roadway produces, in the ornamental view of architecture, undoubtedly a much better effect than a row on

one side only. But to make the effect truly architectural, that is, to make the effect equally good in a technic and phonetic as well as an æsthetic view, it is necessary that the roadway should lead to a definite centre of the buildings, and that it should not be so much of a public thoroughfare as to give the idea of a separation between the two sides. The project in question fails on both these points. Parliament-street leads to nothing. The promoters of the project have sought to remedy this defect by providing a branch street, so that the passenger when about half-way along, can, if he thinks of it, by looking out of his carriage window, get a side view of a side door of Westminster Abbey. Some people have said that that would not be such a very fine sight after all; but at all events it points the moral, which is that the main roadway does not lead to the Abbey. Nor does it to the Houses of Parliament, for, in point of fact, its direction passes just between the two.

But the division of the two blocks of offices by a main thoroughfare is a still more fatal objection in a true architectural view. For convenience of communication it would be a greater barrier than the length of St. James's Park Think of the Secretary for War dodging boldly through a charge of Hansom cab-alry, or the First Lord taking shelter under the lee of the lamp-post in the middle of the roadstead; think of the poor clerks and messengers, and oh! awful chance—think of the crafty foreigner waylaying the convoy, and carrying off the secret despatch. Then the sentiment of architecture requires that the whole of the public offices should be united in one apparent block; they are not so many independent offices conveniently collected together, but, as before said, they are *the* seat of *the* Government. And though a Cabinet may possibly be divided in private, it does not do to continually remind the public that at least two Ministers are always on the opposite side.

Nobody would wish to see the Louvre transplanted to the other side of the Place de la Concorde in order to provide a fine approach to the Chamber of Deputies. Moreover, it would be quite possible to produce the ornamental effect by a row of private buildings on the opposite side of the road, but it would be impossible to prevent the inappropriate effect of dividing the block of public offices, and the Horse Guards could not be retained with this project, nothing could bring it into harmony with any such plan.

The questionable advantage of a closer approximation to the Houses of Parliament has been already discussed; and when one bears in mind that the distance of the farthest part of any site proposed, Spring-gardens, is under half a mile from the Houses of Parliament, it seems hardly worth while to base any argument upon the merits of a greater or less concentration within that distance.

The economical advantage is a material one there is no disputing. The chief part of the saving appears to be obtained by leaving the private buildings on the west side of Parliament-street untouched, and forming the new street west of them, to get the view of the north side of the Abbey; and it is calculated that 500,000*l.* will be saved by this, out of an expenditure of 3,000,000*l.* 500,000*l.* is a weighty argument, but the expense of compelling the owners to re-erect their buildings in a manner corresponding to the public offices, does not appear to have been taken into account.

Nor has it been taken into account what will be the result if this middle row of houses do not turn out a satisfactory thing after all. If it should be found out that it is inconvenient for traffic, too narrow and lofty for good effect, and that it totally destroys the unity of the public offices, an unsatisfactory remedy will have to be applied at a greater ultimate expense than any of the proposed projects.

Upon the whole, however, it appears that this project has the merit of economy, but that that is obtained at the expense of fitness and sentiment. But in an improving country like England to establish any institution on a doubtful or defective system for economy's sake, is a mistake which will lead to increased expenditure in the end,—witness the National Gallery, the Treasury buildings, and some others.

Now let us consider the alternative project of placing the whole of the offices on the west side of the main highway to Westminster. It is the necessity, and at the same time the merit, of any such project that the Horse Guards should be the central feature of it. One of the great architectural difficulties of the whole question is to arrange so huge a mass of buildings into one harmonious group, so that they shall appear to be what they should be in internal arrangement, and what the establishments that occupy them are in reality, an organic body of many parts forming one system with a common centre. The Horse Guards, in its situation and arrangement and with its historic interest, offers this centre. It is no more necessary that the Prime Minister's offices should be there than that a king should sleep in the centre of his palace. The officer who guards the internal peace of the kingdom may very properly be placed there. In another communication we shall examine the plan submitted by Col. Clarke, R.E., and the modified plan that accompanies the present communication.

I. B. C.

EXHIBITION OF THE ROYAL SCOTTISH ACADEMY.

THE forty-third exhibition of the Royal Scottish Academy, now open, is hardly so interesting as was its predecessor, and that notwithstanding there is an unusual number of works in it which appeared in the exhibition of the Royal Academy last year; of these it will be unnecessary to say anything now in this place. Although there is nothing very striking or remarkable in the works of the local artists, it is satisfactory to observe that there is a steady advance evinced by most of them, particularly as regards colour—a quality in which the Scottish school was rather deficient. Conspicuous in this march of improvement stands Mr. Keely Halswell, who sends several subjects from Rome illustrative of life and character in the Eternal City: Nos. 111, "Dolce far niente," and 660, "Contadini waiting for Hire at the Theatre of Marcellus." Mr. Halswell used to indulge in crude intense local colour, but now his productions are marked by a rich and subdued tonality, accompanied by good texture and vigorous, though in parts loose, drawing. Our attention was arrested by a lovely piece of colour by Mr. G. P. Chalmers (No. 527), "Worn Out." It represents an old lady in a rich and quaint costume, who has fallen asleep beside her spinning wheel. The management of the blue and red in the drapery is excellent, and that of the flesh colour equally so. The former works of this artist were deficient in drawing, but in this instance there is no cause for fault-finding in that respect. No. 145, "The Young Trawlers," by W. Mactaggart, is another example of improvement in colour, and the improvement is still more marked in other respects. Mr. Mactaggart has little of the sentimental in his nature, and it was not in his line to attempt to illustrate the works of the Poet Laureate. His present works are simple illustrations of every-day life, and yet they are the more truly poetical from the very absence of effort in that direction. The bevy of happy, healthy children, who have taken possession of a fishing boat and net, and are playing at the trade followed by their parents, is delightful to look upon. The accessories are too much subordinated to the figures; to have painted every mesh of the nets hanging on poles, which fill up one side of the picture, would, doubtless, have produced a harsh effect; but the sea and distant shores of the bay are so faintly indicated as to give them an appearance of unreality.

Besides his "Fairy Raid," which attracted a good deal of attention last year, Sir Noel Paton sends (No. 480) "Nickar the Soulless." The being represented is a quaint, weird creation—a man, and yet not quite a man. There is something about him that excites a smile, and yet produces a feeling of compassion and sympathy for the lonely creature as he sits among the reeds and water-plants singing his melancholy ditty. The detail is not so elaborately wrought out as is usual with the artist; but the general effect of it is, to our mind, more satisfactory. We cannot in nature count the blades of grass or the leaves on the trees, nor should we be able to do so in a painting. The subject is taken from "Brother Fabian's Manuscript:"—

> "Where by the marshes
> Boometh the bittern,
> Nickar the soulless one,
> Sits with his ghittern;
> Sits inconsolable,
> Friendless and foeless,
> Waiting his destiny,
> Nickar the soulless."

Mr. Hugh Cameron's scenes from humble life are characterized by excellent taste, the colour is pure and delicate, and the individuals and incidents represented are in keeping with it. Contrast his "Responsibility" (No. 434) with Mr. Leggett's "Showing his Earnings" (No. 15), where vulgarity is rampant. The incident in each is commonplace enough; but in the one case the halo of art is thrown around it; the other is "of the earth earthy."

No. 633, "King James and the Witches," by J. B. Macdonald. Mr. Macdonald is one of the few artists who adhere to historical painting, and the subjects are invariably taken from the history of his native land. The present is a large and ambitious work, representing the "Modern Solomon" trying an old and a young woman for the crime of witchcraft. The very appearance of the old crone is sufficient to have condemned her in the eyes of the superstitious; but it is different with her neighbour, a sensible, comely-looking damsel. Two Presbyterian clergymen stand behind the king's chair, and one appears to be arguing with the other, who seems to have grave doubts of the whole business, and not to place any reliance upon the test by probing to which the damsel is being subjected. Although she does not shrink from the ordeal, the very idea of the fair neck of the young woman being subjected to such treatment produces a disagreeable feeling upon the spectator. There is much character shown both in the expression and attitude of the different figures, and the manipulation is vigorous.

No. 128, "Salmon Fishing on the Tweed," is the best work we have seen from the studio of Mr. R. T. Ross, whose subjects were usually treated in a hard and crude manner; but this defect he has now overcome to a certain extent; were he entirely to succeed in mastering it, his works would be admirable, as they are characterized by good composition and animation.

No. 162, "The Lady and Hudibras," by Mr. Douglas, exhibits a good deal of character in the expressions of Hudibras and his squire, but the colour is harsh and unnatural; the dress of the lady is positively ugly, and yet he can produce both good colour and texture, as is evinced by (No. 610) "Left Behind."

Mr. George Hay must be careful not to run the ludicrous into caricature, as in "Ritchie Monyplies in Fleet-street" (No. 589). The character of Nigel's serving-man, as represented by Scott, is not that of a mountebank, but of an exceedingly vain, yet shrewd Scotsman. The street, with the row of open booths and shopmen offering their wares for sale, are happily rendered, so as to give an air of reality to the scene.

As usual, the exhibition is strong in landscape. Sir George Harvey sends two (No. 475), "Ben Ladi" and (493) "Auchymoor—a Stronghold of the Douglas." The first, a grand mountain with the cool breezes playing around it, and the other a lonely moor with small remains of an ancient fortress; there is little in the subject, but the artist has made the most of it,—indeed, to have produced a picture out of so little gives evidence of a master mind.

Mr. Bough's "Skiddaw from Waterdlath" (No. 229) is not so fine a subject as his "Borrodale" of last year, but it exhibits the same effects of distance, air, and sunshine.

What a different picture Mr. Bough would have made of the magnificent scene represented in (No. 409) "Mountain Scenery in Sutherlandshire, near Laxford," by Mr. A. Perigal. Mr. Perigal does not seem to know the value of gray in a landscape; the transitions from one point of distance to another are not gradated, but every feature is strongly marked, and even the most distant mountains cut hard against the sky.

It is a relief to turn from this picture to (No. 581) "Morning on the Clyde at Dumbarton," by James Cassie, the hazy atmospheric effect of which is true to nature.

Mr. Beattie Brown has been very successful in his view of "Caerlavrock Castle, Dumfriesshire" (No. 582); but he has hardly mastered the grandeur of the scene, "Among the Grampians—Loch Avon" (No. 73), one of the wildest and most impressive spots in the Highlands,—one which is little known to tourists from its being out of the ordinary route, and very difficult of access.

The visitor on entering the galleries is confronted with a remarkable statue, of heroic dimensions, of Dr. Livingstone, by Mrs. D. O. Hill. The attitude is spirited, and not over-strained, and the costume exceedingly picturesque; it is admirably adapted for an open-air monument, and would be much more effective and interesting than the generality of our public statues.

We will speak of the architectural drawings in our next.

SOME RECENT FARMS AND RESIDENCES.*

AMONG useful works we must always class those giving details of actual experience in building residences, whether for the great or small. Books of designs have their value, doubtless, for they may suggest how we can improve upon existing examples; but a record of good works accomplished is often doubly instructive. In process of execution many points in a residence are re-considered; a mass of information gradually accrues concerning some of them, which permits the adoption of useful conformation and appliances that would not have been thought of if the building had not passed beyond the stage of design. Hence, as we premised, a reference to works carried out by experienced architects is of use; and we should welcome the appearance of volumes in which the result of knowledge and practice is given. So we think, after looking through the pages of a recent work, by Mr. Dean, containing a selection from the buildings erected by him in different parts of the country. Some of these are country residences, erected on small landed estates, with pleasure-grounds surrounding them, and having lodges and gates; but most of them are buildings connected with the pursuit of agriculture, farmhouses, farm buildings, and labourers' cottages. They are prefaced with a few sensible remarks relating to choice of site, disposition of the premises, approaches, pleasure-grounds, water-supply, ventilation, and drainage; the desirability of employing architects instead of entrusting works to uncultivated minds; and the nature of different materials. The Tudor style is selected for praise.

The first building shown is the steward's house, built in the Home Park, Windsor, with a suite of rooms in it for the use of her Majesty and the late Prince Consort when visiting the adjoining farm. This was not, however, erected in the style Mr. Dean prefers. It has an Italian air, with its wide, low-pitched roof, and semi-circular-headed windows, arranged singly and in couplets. Her Majesty's rooms, three in number, with an entrance-porch giving access to the first, occupy the front of the house, facing the road to the Castle, which is only one story high; behind them rises the two-storied main body apportioned to the steward. The farm buildings are also amply illustrated with plans, isometrical perspective, elevation, and sections. Those who are not already familiar with the leading scheme in the arrangement of this establishment may here make themselves acquainted with its clever combination of the pastoral, picturesque, and practical. We may give some indication of the ground-plan by describing it as three parallel lines of buildings, with wide yards between each, bordered on two sides by other lines at right-angles with them; the whole forming a quadrangle, the centre of which is occupied by sheep sheds and bullock-boxes. It is, however, so widely known that we need not dwell upon the nicety and finish that appear at every turn; the order and cleanliness meet for Dresden china shepherds and shepherdesses, in the passages behind the languid-eyed cattle, as in the wide open courts where the air seems never able to part with the sweet scent of hay, or in the pens and sties; nor upon the contrivances with which these are attained, and the sources of disorder turned to profit. We shall be giving our readers a better idea of the novelty that is to be found in Mr. Dean's book, if we make more detailed mention of a farmstead erected by him on a large scale in Hungary, for Count Zeleuski. These buildings, our author says, must convince the agriculturists of this country of the importance of pursuing an onward course in agriculture, if they do not wish to see foreigners supplying us with farm produce at a cheaper rate than they can do. This Hungarian establishment is at New Arad, a part of the world that does not seem to be in a very forward state of civilization in other respects, for the state of the country renders it necessary that it should be surrounded with a high wall. This defence follows an oblong form; and at the four corners there are watch-towers, on which sentinels keep guard. There is only one entrance, which is constructed of double walls. On entering through this gateway, which has a clock turret over it, we find all the sheds, pens, and sties for the various animals grouped together in a regular manner, on the right; while on the left lies all the accommodation for the people employed, who consist of married and unmarried men and women: all live within the walls. Looking at the animals first, we see a hundred cows in one long shed—a double row, with fifty in each. Parallel with this, but with a pig-yard intervening, are sheds for fifteen additional cows and forty oxen. Beyond this, with another pig-yard intervening, is a line, of corresponding length, of piggeries, with a shed for forty more supplementing it at right angles; and the first line is bounded with another shed in which are housed the hay-machine, drills, ploughs, harrows, hoes, scarifiers, rollers, and carts, all having their appointed places. The engines, machinery, and most of the implements were sent out from this country. Then there is a shed for sick cattle, placed nearest the side of the farm inhabited by the servants; and there are three provision sheds at opposite distances. The dairy, with its scullery, is also placed at the part of ground most convenient to the servants. In the centre of every yard are manure-tanks. No sheep are provided for. The buildings destined for the homes and work-places of the people employed on the farm group round three sides of a square, the fourth side being that which looks upon the sheds appropriated to the animals, which are accordingly in full view. In the centre of the quadrangle there is a large kitchen with a dining-room on both sides of it, and a bake-house, boiler-house, and wash-house behind it. Beginning at the angle of the quadrangle nearest the gate, we find the rooms for the superintendent, parlour, kitchen, and bedrooms. Close to these are rooms for unmarried servants; and beyond these, again, two cottages for married servants. Turning round into the adjoining side of the square are six more dwellings for married servants. Between the first three and the second, projects a very large workroom, which is well warmed with hot-water pipes; and, over all of them, is an upper story containing ten rooms for "cow maids." On the third side are two more cottages, a hospital, a carpenter's and smith's shop, and another room for the superintendent. Near the hospital is an airing-ground for invalids; and there are drying-grounds, kitchen gardens, and grass plots all around, within the walls: a model colony, fit for a new world as well as for New Arad.

Several of the buildings our author has erected for the Earl of Leicester are illustrated. We will look at two of them: that intended for his lordship's dairy of choice Devon cows, and a pair of labourers' cottages. In the first of these we have a set of buildings, arranged regularly, to run round three sides of an oblong, the outer line of the plan presenting nearly as straight an outline as Count Zeleuski's wall. The fourth side of the oblong is occupied by sheds for stock and bull boxes, with yards and sheds for other purposes, which project into the centre of the oblong and beyond it; forming, indeed, a second oblong group, placed within the first; with the difference between them that one is hollow, the other solid. The last is arranged very methodically. It is intersected by two straight passage ways, which are divided from one another by the bull-boxes mentioned, and a continuation of them set out as calf-sheds and spare sheds, with piggeries. On either side of these passage-ways are the sheds for stock, central yards, and a shed for store pigs on one side, and store calves on the other. In the centre of the outer buildings stands the steaming-house, with sheds for roots and cakes on either side of it, and granary and store-room over them. A cow-house on one side, and boxes for show cattle, with shed for hay and straw, on the other, complete this side of the farm-buildings. In the two advancing wings are the horse-boxes, stables, and gighouse, on the one hand; and shed for cutting hay, another for cut hay, cart-lodge, harness-room, chaff-room, and stables, on the other. This is an arrangement Mr. Dean has repeated, with a few variations, at Leamington. The Earl's cottages shown are semi-detached. There is a projection on the front line of the plan formed by the living-rooms of the two dwellings, and carried up to the second story; but for this the outline would be that of an oblong figure. The entrance is through a porch in the side of the house, which does not project, but is carried up to the upper story, where, with some additional space over the larder, it forms a bedroom. There are no less than four doors into the living-room: one from the porch, another into the larder, a third leading to the stairs, a fourth into the scullery on the rear of it. Above stairs there are three bedrooms. In another pair of semi-detached cottages, built near Warrington, Cheshire, Mr. Dean gives four doors to the living-room, which, we submit, is rather a large allowance.

We will turn now to one of the country residences built in the Tudor style. There are several of them. The first shown is that built for the occupation of one of the Earl of Leicester's tenants at Castle Acre, Norfolk. This, our author says, has been objected to on the score that it is good enough for the earl's eldest son. Without gainsaying this opinion, he adds, that he is sure it is not too good for the enterprising farmer for whom it is intended, nor, indeed, for many of the farmers on the same estate. The next is situated at Moorlands, near York, and presents in an eminent degree that variety of outline of which the author thinks the style so capable. It is, indeed, rather too much cut up in this particular, nearly every window on the principal front being a distinct feature, with a different construction to any of the rest. As Mr. Dean remarks in the course of his prefatory observations, "eminent attainments are not the produce of a day," but rather of diligence, favoured with some encouragement, and the full power and poetry of the style that produced some of our best old English mansions, cannot be grasped without a long study of it. The Tudor residences of to-day are, in reality, far behind the picturesque, pleasant-faced country-houses of Elizabethan times. Mr. Dean's are no exception to this rule. The long experience that he has brought to bear upon farm-buildings, has been so much time taken from more strictly artistic studies; and his Tudor façades suffer in consequence. The charming air of serenity and order, and the modest stateliness of the old houses, are but ill rendered in our imitations of them. Modern lavishness with angular and canted projections, gables and hipped gables, is no compensation for these missing qualities: the more ins and outs, and odds and ends, the farther we get from the consummate repose of the old places.

In the drawing-room at Moorlands there are no less than fourteen projections and recesses, besides the chimney-breast and a large bow-window; and in the dining-room a similar profusion of corners is to be counted. A handsome feature in the internal arrangements makes some amends for the eccentricity in the principal rooms. Right through the house, at the point of its greatest width, sweeps one wide corridor, with a porch at each end of it. One of these last might have been dispensed with, perhaps, more especially as there is a third entrance from the grounds into a conservatory, projecting from the main front between the drawing and dining rooms, as well as a fourth or back door in the rear of the house. Doors are, we observe, very liberally dealt out again in the kitchen, where we count four more. We do not object to the nine in the corridor, because here they are in their proper place; but an ordinary-sized room with more than two doors in it scarcely retains its domestic character. We think Mr. Dean is happier in the Italian style, which evidently has not, in his mind, so many exigencies. Looking at the next example, which is of a residence in a park of 30 acres, near Lavenham, Suffolk, we see nearly as much accommodation, packed much closer together. Here one entrance-door suffices, and one door apiece for the dining, drawing, and breakfast rooms. The kitchen has only three, one of which opens into a pantry, conveniently; but it has the drawback of being separated from the scullery, with which is combined a brew-house, by an intervening store-room and passage. In a line with the kitchen is a combination of dairy and larder. In the rear is a kitchen court-yard, where are the W.-C.s and coal-house, built as lean-tos; and beyond this extends a long stable-yard, in which is a provision for six cows besides; a straw-house, a three-stalled stable, a couple of loose boxes, a coach-house, and a harness-room. And here we recognise Mr. Dean's special experience again. These successive accommodations are arranged with skill. The cows are not permitted to enter the yard, although their house is part of the yard-buildings, but are furnished with entrances outside of it; and the straw-house is close to them, and has two doors, from one of which the cows can be attended to, the other opening into the yard; which last door can be closed when the store of straw is being carried in, to prevent any litter in the yard. The

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* A Series of selected Designs for Country Residences, Entrance Lodges, Farm Offices, Cottages, &c., which have been erected for H.R.H. the late Prince Consort, the Earl of Leicester, Lord Harris, Hon. G. W. Fitzwilliam, &c., under the superintendence of George Alfred Dean, Lancaster-place, Strand, London; and Messrs. Dean & Jerman, York. By G. A. Dean. Worthing: C. H. Knight. York: J. Sampson. London: Longmans, Green, Reader, & Dyer. 1867.

horses, too, are kept well away from the house by the intervention of the harness-room and coach-house. The front elevation, which is of two stories, is unpretending and pleasing. On the ground-floor are the windows of the dining and drawing rooms, five semicircular-headed lights grouped together, precisely alike. In the distance, extending beyond the block containing these rooms, on both sides of it, like diminutive wings, can be seen a portion of the offices, one story high, and corresponding exactly with one another. Over the dining and drawing room windows are two triplets of semicircular-headed lights, like those below, which belong to the rooms over them. The only break in the uniformity of the design is a low-pitched gable as a finish to the portion of the house occupied by the drawing-room and bed-room over, which, to admit of this feature, is brought slightly out beyond the line of the dining-room wall.

In plate 7 we are shown a Norfolk rectory and offices. This has a singularly straggling plan, affording a marked contrast to that just described. Adjoining part of the drawing-room wall is the pantry; while the kitchen and scullery are built in a rear wing, with a stable-yard beyond them. Altogether, a space of 100 ft. long by upwards of 60 ft. is covered with these buildings, and though the widest part of the ground plan of the house is not quite 70 ft., we are struck with the amount of ground occupied with the very modest accommodation. On the next sheet we have a house, built for a widow lady and her two daughters at Roehampton, Surrey, containing quite as many rooms of very nearly the same dimensions on less than two-thirds of the grounds. But in this design the Tudor style is abandoned. There is a semi-sunken basement to the little residence in which, we perceive, Mr. Dean places the servants' bed-room, again showing himself to be singularly content with an unsanitary arrangement for the human being, which he has not in one instance planned for an animal. With this exception the internal arrangements appear good.

On another sheet the author shows additions he made to a farmhouse in Lancashire, of which he is in charge as receiver, where all the arrangements are in favour of the large number of cows kept for dairying purposes, and of the proper storage of their produce.

We are shown two shooting-boxes in Invernesshire,—one at Stratherrick, the other at Strathdeam. These are both suited to their purpose. They each contain a small sitting-room, where the host and his friends can hide their hungry and impatient heads, should they arrive home earlier than they are expected from the treacherous, but all the more fascinating, moors; a large dining-room, in which they can compensate themselves; two or three little bed-rooms, and a large bath-room; a good-sized kitchen, with a pantry; and a dairy sunk in the basement. Both have a bedroom on the ground-floor, and in the first example a closet is cut off the kitchen for a servant's bedroom. The exteriors bring them, as near as possible, within the literal meaning of the term shooting-boxes. No idea of the cost of the respective buildings is given in any case. In most instances the information is not of much value, in consequence of the difference in price of materials in different parts of the country; but in this case it might have been useful, as indicating the possible value of any deduction from, or addition to, similar buildings in the same part of the country.

At Muswell-hill, Hornsey, the author appears to have realized a very popular wish. He has built a miniature farm: so small and compact and prepossessing, that we should not be surprised to hear that several have been since built in its neighbourhood in imitation of it, or that it has been taken to pieces and transported, like a Swiss toy-farm, to be erected elsewhere. Standing at the light iron gate, and looking into the farm-yard, you see a small cowhouse for four cows on the right of you; and on the left, built to correspond with this, another house divided into three compartments, for hens, geese, and ducks. Straight in front of you, across the yard, are two piggeries, with a passage-way behind them to the boiling-house in the angle beyond the cow-shed; and that is all. To the left of the poultry-house is a second small yard, into which its doors open, so that the birds do not come into the farm-yard; and in the second yard there is, forming a sort of ornamental turret to the entrance gateway, a large dovecote. Nothing on so small a scale could be more complete.

Our last selection from Mr. Dean's volume shall be the buildings for a Cheshire farm of 1,000 acres of arable land. Here every point of vantage that could be gained by consideration and experience seems to have been obtained. The residence for the bailiff, with a garden before the front, occupies one angle of the large piece of ground, some 246 ft. by more, covered by this farmstead. Recessed from the house and back garden, but continuing the boundary line on one side, are the arrangements for the poultry and cows; the dairy open on three sides, and cooled with a fountain; the poultry-houses warmed with hot water in pipes brought from the scalding-house; the yards furnished with central tanks; the ducks with an artificial pond; the cow-boxes with feeding passages opening out of the provision-shed between them and the calf-pens. Departing from the house in the direction at right angles to this are the office, men's rooms, tool-house, drill-house, entrance from the public road, house for wagons and carts, provision-shed, another house for carts and wagons on the other side of this, another entrance from the road, like the first, 16 ft. wide, a dung-pit and liquid manure tank in the corner of it, a carpenter's shop and blacksmiths' shops in succession. Returning at right angles with this is a long implement-shed and engine-house, which brings us up to the barn, which occupies a central position on this outer line of the buildings. Right and left of the forepart of it are the provision-shed and chaff-house. At the rear end are two openings, one to a railway for corn-stacks, the other into the cornstack sheds. There is an upper floor to the barn, with a feeding-place for the thrashing-machine, and there is a granary over the chaff and provision sheds. On the other side of the last-mentioned places is a double row of cattle-boxes, with lofts over them. Mr. Dean explains that he considers lofts over sheds objectionable generally speaking, but in this instance they are not so, as there are an 8 ft. cart passage and tramway between the two rows of boxes. The straw required for littering the cattle is lowered through trap-doors over them, which economizes labour. The last of the cattle-boxes mentioned is separated from another dung-pit by a paved shoot. This brings us to the fourth side of the enclosure, in which are the accommodation for the horses, the gig-house, and an infirmary. Behind each horse as it stands in its stall is an enclosed recess for the harness. In the centre of the large square that we have now traced stands the boiling-house, with its food tanks, and right and left of this are piggeries, where nearly 200 pigs can be fattened; sheep-pens and cattle-sheds open to yards. A tramway facilitates the carriage of the food from the boiling-house, and in the case of the pigs a further saving of labour is effected by the use of a hose to the liquid food truck. Beneath the sparred floors on which the sheep stand in their pens are powdered gypsum charcoal and burnt clay, for the purpose of utilizing their manure. The calves stand on perforated floors, which their hoofs do not cut. These are removable, like the sparred floors, and are lifted up when the manure has to be removed. But the perfection with which everything is housed would not be completely indicated if we did not mention that an open shed is provided for the cornstacks, which need not, therefore, be thatched. They are placed on frames, and when one is required for the threshing machine, a lower frame, on wheels, is driven under it, the blocks knocked away, and the stack, with its frame, drawn bodily by a rope attached to the steam-engine, to the feeding place of the machine.

The greater the number of people who are shown such model farms the fewer there will be content with more slovenly, extravagant, wasteful, inferior management and arrangements; and so the world gets helped on a little in one department.

A WORD FOR SUN-DIALS.

ABOUT thrice a year the questions of "S. H. W.," in the *Builder* of 20th February, recur, in precisely the same form: "What inclination am 'I' to give the gnomon of my dial?"—without a hint as to where "*I*" lives; "and how am I to divide the hour scale?"

Whoever can project the simplest constructions the carpenter requires in solid geometry—those for a hip-rafter, for instance,—may readily construct any kind of sun-dial whatever, for any latitude, on being simply informed of these two invariable rules:—

1. The shadow-casting edge is a straight line, and must *always, everywhere*, and in *whatever* form of dial, be *parallel to the earth's axis*. Consequently, all the true gnomons in the world are parallel, and with one varying from their direction no true dial could be made, but its time would vary every day in the year.

2. The hour-lines, on whatever surface, plane or not, are the intersections of that surface by planes all meeting at the shadow-casting edge, and making equal angles thereat. Consequently, having found the twelve o'clock *plane* (which is the meridian), the eleven and one o'clock *planes* must be inclined thereto 15°, the ten and two o'clock *planes* 30°, and so on; their common intersection being the gnomon edge.

With a right gnomon then, hour lines may be marked over any surface or surfaces whatever. Whoever cannot do this cannot make the lines for a hip-rafter, or any the simplest matter in carpentry. I am obliged to say "carpentry," not *building*, because in no branch of building craft but the carpenter's do we any longer attempt more practical science than the builders of Timbuctoo. Four centuries ago, when a nation lived here that could build a Redcliff Church, independent of all timber, we might have said the dial problems were tests that would prove one not only no carpenter, but no mason. It is widely different, of course, in an age of Royal Institutes of Architects, &c., when the idea of requiring, for instance, a fire-proof repository for wills, is held to transcend just as much the science of an isle of Britain as of an isle of Madagascar.

"S. H. W." will perceive then, that the gnomon being required always to be perpendicular to the earth's equator, the divisions of the scale can only be equal (or drawn in a simple and obvious way), when they are on a circle (or other lines), parallel to the said plane, of the earth's equator. In fact, the most natural, most obvious, and *best* thing to do, is to make your dial with no surfaces but what are either parallel or perpendicular to that plane. The best thing, because all such equatorial dials are equally fitted to any place to which you carry them, as you have only to turn them to the true meridian, and tilt the whole bodily to the inclination answering to the latitude. Moreover, as one instance of the fact that the truest engineering form of everything will be found its most artistic form, I challenge any one to produce a non-equatorial dial of any kind, anywhere, that can be called a decently elegant object; but the elegant forms of equatorial ones are unlimited, from the hollow parts of globes, of ancient Greek design, in the British Museum, to the thick Latin cross, and all manner of Maltese and curvilinear crosses and trefoils, their edges, perpendicular to the equator, forming their own gnomons, with no thin trumpery metal to be always bent out of truth. But makers do not always remember that the minute scales are required, both at the upper and lower edges of these solids, the upper alone serving during the six winter months, and the lower during the summer. Moreover, the thickness requires to be such, that the greatest distance from any part of a scale to its gnomon may not exceed 2·3 times that gnomon's length; otherwise, at midsummer and midwinter the sun's declination of 23½° will carry the shadow entirely off the scale.

Contrasted with these, the hideous inventions known as *horisontal* and *vertical* dials, whose drawing the last two centuries exalted into an "art of dialling," with their flimsy unmechanical metal gnomons like caricature noses, must, of course, be each specially made for its latitude and even its particular wall, and useless if removed. Sometimes an architect insists on a vertical one facing almost east or west, of which a peculiarly useless and ugly specimen may be seen on the new school at Highgate.

Most persons, probably, know that theoretic sun-dial time is not, except on four days of the year, the true clock time of the place; which latter again, away from the longitude of Greenwich, is not now railway time. But few are aware, for I have seen no book notice it, that the *practical* sun-dial time never is, or can be, within one minute of the *theoretic*, or that meant in all extant almanacs and "equation of time" tables. To make use of the sun-dial at present, it is necessary to distinguish these *four* kinds of time. Between the railway and local clock time (if the latter be used at all), the difference and its reasons are so generally understood that nothing need be said; except that people must remember the almanac columns headed "clock bef. sun," and "clock aft. sun," refer to their *local* clock time, and could not be given in *railway* time

without a separate almanac for each town. They must, therefore, combine the numbers thus given, by addition or subtraction with the known constant difference from Greenwich time, due to their longitude.

The *minutes* of the equation of time, for any day, are generally the same every year, but not the *seconds*; and the four times of no equation or of maximum equation may each fall, in different years, on the former or latter of two days (just as the equinoxes may). The only reason the same table will not serve for two successive years is the excess of the year over an exact number of days. Thus, 1868 being a leap-year, was above 18 hours longer than a true year, while 1869 is to be nearly six hours less than a true one. If the excess were an exact quarter of a day, this table would be the same for any year as for the fourth before or after it; and four tables would serve by turns continually. But the defect of the fraction from six hours prevents this, and makes another gradual accumulation of differences, till the tables of two dates 96 years apart differ nearly as much as two successive years. This, again, in our present Gregorian style, is *over*-corrected by the day omitted from the centurial year; and yet again *under*-corrected by the retention of the day in the 400th year; and thus it happens that, practically, while the world stands, each year must have its own table.

In astronomical books, however, you see a practically *permanent* "equation of time" table made, by omitting days of the months, and substituting the sun's longitude. You may also regard it as dependent on the sun's *declination* only, in this way,—He crosses any given declination circle twice a year, and to each declination belong no more than *two* amounts of dial correction, one whenever the sun passes that declination in going southward, the other when he passes it in coming northward. (To each tropic, however, and to one intermediate circle, about 10° N., there belongs only *one* dial error.) Hence the Mediævals got a simple and elegant way of setting their clocks. In some Italian cathedrals the transept has a meridian line marked on the pavement, and a lens in the south window casts an image of the sun, whose centre of course crosses this line every day at *dial* noon; but further north or south each day, as his declination varies. Now do not imagine the Mediæval architects stopped here. They found how to so construct another line, a most difficult curve, lying half east and half west of this straight one, that the sun's image crosses this curve every day at *clock* noon!

This curve, resembling a very lengthened figure of 8, is called the *analemma*. We may see it drawn now on a small scale, but never well, on a vacant part of the ocean of some terrestrial globes,—its lower or big loop standing on the south tropic, and its lesser loop reaching to the northern. If correctly drawn, the resemblance to an *Italic* 8 would be so complete that it would *lean* a little from the meridian.

This figure, then, served (as it might again) all the purposes of our "equation of time" tables. Few people know that the two maximum errors, which occur in November and February, when the clock is furthest behind and before the sun, are not equal. One is nearly seventeen minutes, and the other barely sixteen. Now this arises from the Italic leaning of the 8, and is increasing, and will increase for many centuries to come. But about A.D. 1250 (from which date our globe-makers would seem to take their "analemma" unchanged) though the loops were more unequal than now, the 8 was *upright*. Before 1250, it had leant the other way, ever since Adam's time. But about his time it was not only upright, but the loops, instead of being at their greatest inequality (as in 1250), were *equal*; as they become only once in about 13,000 years. Throughout these 13,000 years the southern loop continues biggest; and then, for another 13,000, the northern will be biggest, and the present changes will all be repeated inversely. Thus I called the astronomers' tables, that substitute the sun's longitude for the months and days, "practically" permanent, but they do not serve for ever.

Tables and almanacs all refer at present to *theoretic* sun-dial time, namely, what would be marked on the dial by an infinitely bright point of light, occupying the place of the sun's centre. Now, most people may have noticed that an electric light, lime light, or even good gas light, when further off than a few yards, casts clearer and sharper shadows than the sun, or than the same lights when nearer. The reason is the smaller amount of *penumbra*. Penumbra is that space from which the sun's disc (or gas flame or other light) is partly, but only partly, hidden. It forms a border, shading off from the edge of the *pure shadow* (which edge, observe, in the sun's case, is always quite *perceptible*) to another outer edge, which last is always quite *imperceptible*. Now the theoretic shadow's edge is half-way between these, or at the middle of the penumbra. But you cannot estimate this middle, because while, as I have said, the line dividing pure shadow from penumbra is well marked, so that all eyes tolerably good will agree upon it, the limit of penumbra from full light you shall hardly get two to agree upon. There are good optical reasons why this should be so. Now, the penumbra covers always, on the sun-dial scale, two full minutes of time, unavoidably; and the only side of it, or part of it, that you can practically define is its division from pure shadow. Hence, you see, *practical* dial time must always be a full minute before the theoretic throughout the forenoon, and a full minute after it in the afternoon; or rather the former, whenever you are using the following side of a shadow, and the latter when using its advanced side; for dials may be so made that you employ the same side throughout the day, or variously. This correction may be considered practically invariable in amount, and always one full minute; though strictly it is always a little more, and varies about 2 seconds, the maximum being some 64 seconds in January, and the minimum 62 in July.

If you use a bar for a gnomon, the theoretic shadow is, at all distances, just as wide as the bar; but the pure shadow diminishes till, at 110 times the bar's width, it vanishes, and at that same distance the penumbra is double its width; but no eye would detect it to be so wide.

With these items of information, I will now propose to "S. H. W.," or any reader, the exercise, which ought to be easy, of designing a dial, either above or below the eye, to show, by mere inspection, clock time (and no other), either local, or, if desired, railway time, or an approximation never erring 20 seconds therefrom; and this error to be avoided if two gnomons are provided for use alternately, half a year each.

E. L. G.

P.S.—The difference between the almanacs' dial time and that marked by the boundary of pure shadow, is both rather greater and more variable than I stated above. The *Nautical Magazine* has, on page 1 of each month, a column headed, "Sidereal Time of the Semidiameter passing the Meridian" (with a foot-note for reducing the same to mean time), showing that this—unlike the semidiameter itself, which has but one maximum and one minimum in the year—has two minima of about 64 seconds, when the sun is in 2° N., on March 26 and September 17, whence it increases to a maximum of no less than 71 seconds at the southern tropic, and another of 69 at the northern. By setting off distances representing these, each way, from the 8-shaped analemma curve (as projected on a cylinder or Mercator's chart), we get two other slightly different 8.s, which the sun's image from a lens would exactly *touch*, so as to be confined between them at the moment of clock noon throughout the year. Remember that the analemma, though always 8-shaped, is not the same when projected on a *globe* as on a *cylinder*; and would be quite different again on any *plane*, especially the horizontal floor of an Italian church, where the inequality of the two loops becomes exaggerated. On the globe projection we should get the new curves by applying the sun's semidiameter merely; but on the cylinder we must apply the times of its passing, as per Nautical Almanac. Now for these curves it would be easy to derive four profiles for baluster-shaped gnomons, which, being applied to an equatorial dial or dials, would mark *mean* time (and that of a different place, as Greenwich, if desired) without one half-second's error throughout the century; and each of the four might do so for above five months: the winter and spring gnomons both serving together from early in January to early in June, and the summer and autumn ones both serving from about the 1st of July to 1st of December. I name them by our northern seasons, but these gnomons would equally apply throughout the globe, and everywhere it is only for a few days before and after the June solstice, and about twenty before and after the December solstice, that we need be restricted to a single gnomon.

Six centuries ago, when the 8 was upright, a single gnomon might have been made to show clock time throughout the year, but I do not see that it now could for quite six months. At the time of the upright 8, the exact solstices were times of no dial error, but now the corresponding times are a week earlier than each solstice, and at the exact tropics the sun is 1 min. 25 sec. behind, or 1 min. 17 secs. before the clock. These are not quantities that in railway times we can neglect, and as the leaning of the 8 will increase for centuries, it will become less and less possible to make one gnomon serve through the year.

Mean time was only introduced at Paris in 1815, and Arago says riots were anticipated at the workmen finding a noon struck by the clocks that would not truly halve the time between sunrise and sunset; but they seem not to have observed it. Before that date the clocks, though professedly adjusted to the sun daily, were sometimes striking for half an hour. Adjustment each day was quite needless, for James Fergusson showed in his "*Mechanics*" how a clock may, with very slight and quite practical additions, be made to keep apparent solar time. The principle is that of cams. But I am not aware of the problem now propounded, to make *dials* keep *clock* time, having ever been broached before.

E. L. G.

SIR,—Your correspondent, "S. H. W.," does not appear to know that to make a dial correctly it is necessary to ascertain the exact latitude of the place in which it is intended to erect it, as both "the angle at which the gnomon should be placed, and the method of dividing the hours," depend on this.

Works on dialling are not numerous, but the best I have met with is an old one, entitled, "The Art of Dialling," by Thomas Fale, printed at London in 1626.

There is a useful little pamphlet on this subject,—"Dialling Diagrams," by William Watson, of Pocklington, 1854, published at one shilling, by J. Forth, Pocklington.

I have been long looking out for a copy of Peter Nicholson, on Dialling, published many years ago, but now out of print. Should any of your readers know of a copy for sale, I should be glad to hear of it.

If "S. H. W." finds any difficulty in setting out his dial, I shall be happy to assist him, if he will give me the latitude required, as well as the size and shape he wishes his dial-plate to be made.

WM. OSMOND.

Salisbury.

SIR,—In reply to "S. H. W.," the gnomon of a dial must be placed at an angle corresponding with the latitude of the place where the dial is fixed, which will be seen by reference to an Ordnance map, half-inch or 1 in. to the mile. When the gnomon is set up the hour lines can be marked off on a fine day by means of a good clock or watch, provided this is set to solar time, which can be found by reference to an almanac. The base line of the triangle, of which the gnomon is hypothenuse, must point north, for which the exact variation of compass must be found for present time. The variation of local time is four minutes per degree of longitude east fast and west slow; this may be ascertained by reference to the map. If your correspondent is well acquainted with mathematics, Hymer's astronomy is the best work to consult.

WALTER SCARGILL.

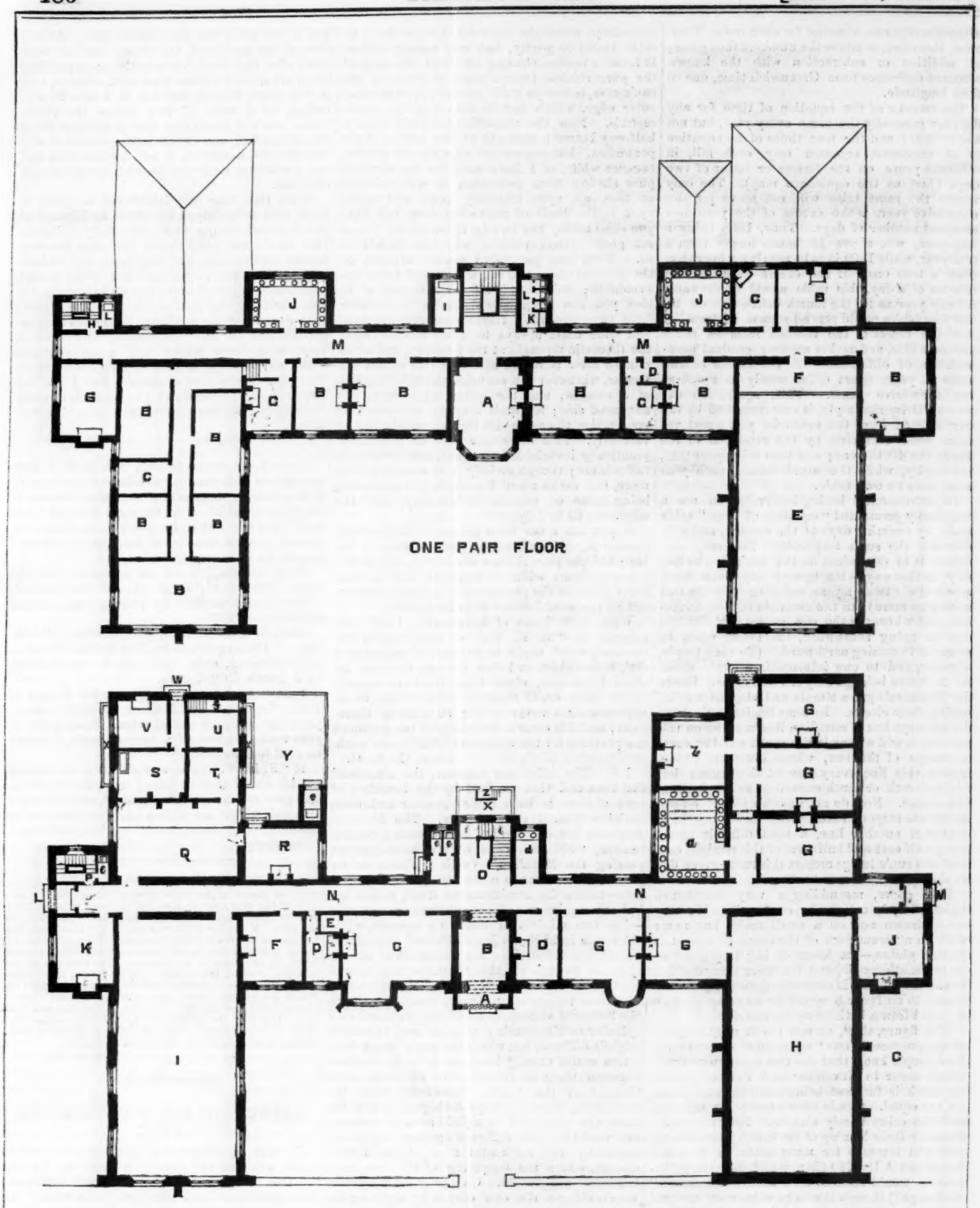
PAYMENT OF DISTRICT SURVEYORS' FEES.

IT may be interesting to those concerned to know that, in the case of a claim for the fees of four houses near Queen's-road, Battersea, the owner has been adjudged liable to pay the district surveyor's fee, although an account had more than six months previously been rendered to the builder.

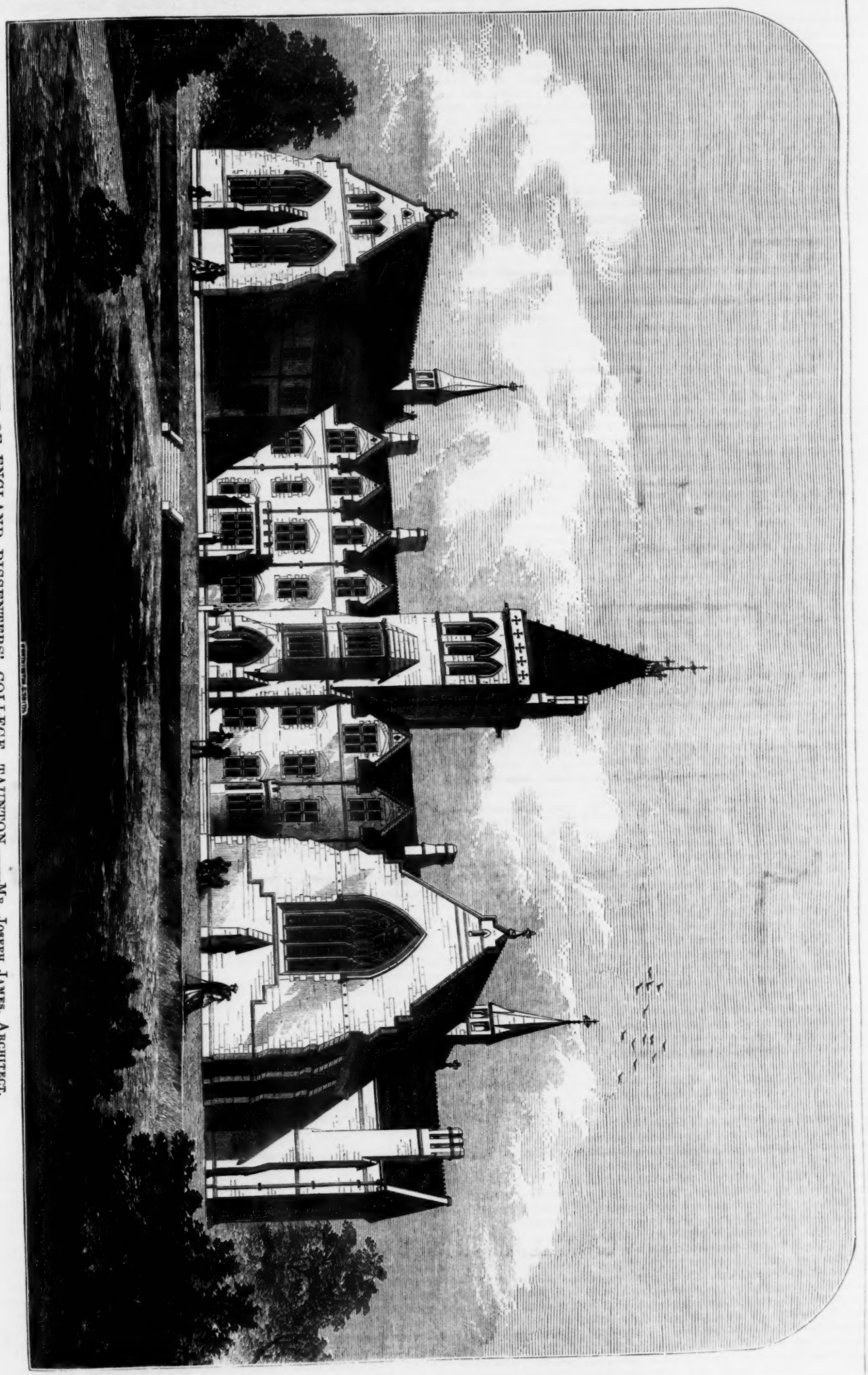
In evidence it was stated that the district surveyor had rendered an account to the builder more than six months previously; that he had applied to the builder, and had failed to obtain his fees from him. The fact of the ownership on the part of the party summoned was not disputed, neither was the account rendered to him; but the owner, through his solicitor, contended that the claim was not against the property, but against the owner; that he had become owner by purchase after the claim for fees was made, and, therefore, was not liable. The magistrate, however, decided that the owner or occupier remained liable until the fee was paid.

This, taken in conjunction with the recent case reported by you in the case of the District Surveyor against Wood, which was also in my district, leaves no doubt as to the liability of the owner, although the claim may have originally been made on the builder.

EDWARD I'ANSON.



THE WEST OF ENGLAND DISSENTERS' COLLEGE.



THE WEST OF ENGLAND DISSENTERS' COLLEGE, TAUNTON.—MR. JOSEPH JAMES, ARCHITECT.

THE DISSENTERS' COLLEGE, TAUNTON.

THE West of England Dissenters' Proprietary School was established at Taunton, in the year 1847, by "men anxious to elevate early instruction by combining it with religious influence, and who have acted upon the conviction that the success of their project demanded that the education offered should be of such a character as to vie, both in excellence and economy, with the best grammar and endowed schools in the district."

The scheme has been worked with great success, both in regard to the scholars educated, many of whom are now in prominent positions, and also from a pecuniary point of view; inasmuch as, although a good dividend has generally been paid to the proprietors, a large sum has been allowed to accumulate, for the purposes of the new building.

In June, 1866, the committee invited designs from six architects, from which one by Mr. Joseph James, of London, was accepted, and is now being carried out by Mr. Henry Davis, of Taunton, who re-erected the tower of St. Mary Magdalene, Taunton, some years since.

It will be seen by reference to the plan, that the general arrangement is such as to keep each department distinct, but at the same time within easy approach of each other. Accommodation is provided for 150 boys, in separate beds, in moderate-sized dormitories.

The present contract amounts to 10,500*l.*, but does not include covered playground, water-closets, heating apparatus, &c.

Advantage will be taken of a stream running through the estate to erect a covered plunge-bath, and ample space will be afforded for playgrounds. There is a large mansion on the estate, which was formerly used as a private lunatic asylum, and which is surrounded by some magnificent trees and shrubberies. This house will be used as a residence for the head master, and as a laundry.

The heating apparatus will be provided by Mr. J. M. Fisher, of Taunton, who has had much experience in this kind of work. Mr. George Salmon is the clerk of the works. The building, when completed, will form a prominent object to travellers by the Bristol and Exeter railway.

REFERENCES.

GROUND FLOOR.

A. Public entrance.
B. Entrance-hall.
C. Committee-room.
D. Master.
E. Strong-room.
F. Principal's sitting-room.
G. Class-room.
H. School-room.
I. Dining-hall.
J. Junior master's day-room.
K. Steward's and matron's sitting-room.
L. Steward's entrance.
M. Boys' entrance.
N. Corridor.
O. Staircase.
P. Private staircase.
Q. Kitchen.
R. Servants' hall.
S. Scullery.
T. Pantry.
U. Larder.
V. Manservants' bed-rooms.
W. Trade entrance.
X. Area.
Y. Kitchen yard.
Z. To heating.
a. Day lavatory.
b. Music-room.
c. Play-grounds.
d. Lavatory.
e. W.C.
f. To stores.

ONE-PAIR FLOOR.

A. Linen-room.
B. Dormitory.
C. Master.
D. Closet.
E. Upper part of school-room, with open-framed roof.
F. Music gallery.
G. Steward and matron's bedroom.
H. Private stairs.
I. Bath-room.
J. Lavatory.
K. Urinal.
L. W.C.
M. Corridor.

THE GREAT VIADUCT ACROSS THE SOLWAY.

THE great engineering undertaking of forming a direct line of railway between the south of Scotland and the west coast of Cumberland by means of bridging the broad estuary of the Solway Firth, is now almost completed. The earthworks are finished throughout, the masonry may likewise be said to be finished, the viaduct has been completed for some time, and the permanent way has been laid for sixteen out of the eighteen miles of the line. The principal work remaining to be done is ballasting, the formation of the junctions, and the stations. An unreclaimed moss on the Cumberland side, over a mile and three-quarters of which the line has had to be carried, has been a great difficulty in the construction, very heavy and extensive draining operations being required, and great labour being consumed in laying the way over it. The distinctive feature of the line is the viaduct across the Solway. At the point where the railway crosses the Firth, the distance from shore to shore is 2,544 yards, or a mile and between three and four furlongs. Of this stretch nearly 600 yards are composed of sea embankment, and the remaining 1,950 yards consist of the iron viaduct. The sea bank on the Scottish shore is seven chains long, and 28 ft. deep at the extreme end where it joins the viaduct. On the Cumberland shore the sea bank measures twenty-one chains in length, and at the extreme end it is 29 ft. deep. These banks have been a source of considerable anxiety in making, as the spring-tides rise upon them 21 ft. and 22 ft. The core of the banks is made with clay. The outside is then puddle a depth of 1 ft.; a layer of broken stones and quarry red averaging 2 ft. in thickness is laid over the puddle; and upon the quarry red the pitching is set, the stones being from 15 in. to 18 in. deep. The Seafield bank on the north side of the Solway has been completed for some time, and the bank on the south or Cumberland shore is rapidly approaching completion.

The principle upon which the viaduct is constructed shows simplicity of design. The structure is built of wrought and cast iron. The wrought-iron is used for the girders which span the bays, and likewise for the cross-bracing which stiffens the whole structure. These bays or spans are 30 ft. in length. The pillars that support the girders at intervals of 30 ft. are composed of cast-iron. The foundations are piles about 20 ft. long; but these vary according to the nature of the strata in which they are driven. They are 12 in. in diameter, cast hollow, the thickness of the metal being $\frac{1}{2}$ in. They were cast with a chilled point for driving, and were all driven at low water from barges fitted with patent pile-driving engines, the monkeys used for this operation weighing about 20 cwt. The levels of the foundation-piles vary with the bed of the Solway. The lowest level is in the English channel, where the top of the foundation-piles is within 18 inches of low water of spring tides; and the height from the foundation-piles to the level of the rails is 38 feet. Each pier is composed of six columns, of which the foundation or driving-pile is the lowest; and the height from the foundation-piles to the girders is made up of columns 9 ft. in length, cast with flanges at their end, and bolted together at their junction, the faces being turned in lathes to ensure a perfect fit. Angle-irons are placed between the columns, and the angle-irons are again tied together by diagonal bracing. Although there are six foundation-piles driven, five only are made use of for the single structure; but as the addition of a sixth is all that is required to enable the line to be doubled at any future period, the directors determined to make this provision, the extra outlay being immaterial compared with what it would be to drive a single pile at each pier separately afterwards. The platform of the viaduct is covered with Mallet's patent buckled plates, which are riveted to the girders and to each other by strips of iron, this helping to give stiffness to the structure. The permanent way is laid on longitudinal timbers, bolted through to the two middle girders. The longitudinals are secured in their places by ties and transomes at intervals of 10 feet. The rails are secured by cast-iron chairs, spiked to the timbers. A light handrail, supported by cast-iron standards, is fixed on both sides of the viaduct for its entire length.

The total weight of cast-iron in the viaduct is 2,892 tons, and of wrought-iron 1,807 tons. The whole of the superstructure was erected without scaffolding. It is expected that the total cost of spanning the Solway and forming the sea-banks will not exceed 100,000*l.*

LIFE AND DEATH MAPS.

IN an interesting article on the above subject, which appeared in the *Builder*, on the 23rd ult., you were good enough to notice my efforts to illustrate the geographical distribution of disease in England and Wales, and I thank you not only for your having taken the trouble to understand what I endeavoured to show at the Medical Society, but for the many proofs that the article contained of your opinion as to the public utility of my researches.

I have always contended that the geographical distribution of disease is a study of the highest importance, to us islanders especially; for our population is wonderfully increasing, and it is high time that our attention be directed to the future sites of our new habitations, towns, and cities.

Before, however, entering further upon this subject, I wish to explain my reasons for using two colours instead of different *shades* of one in the chartographical illustrations of disease-distribution. In drawing and colouring my maps, the first object was to impress the idea of the student at once with the most prominent parts displayed. To do this, I tried the old plan of shading, and many new plans of my own, but found that they all more or less failed to accomplish what I desired. On using, however, the two colours, *red* and *blue*, I at once found how much easier my own task became in comprehending the groups. These two colours strike the eye at once, are pleasing to it, and give me an opportunity of using them to aid the memory technically in remembering which are the most and which the least healthy districts in respect of any disease displayed. The *red* is the *healthy*, the *minus* average colour, and is typical of the floridly red arterial or well-oxygenated blood; the *blue* or *plus* average colour is the reverse; it represents defective circulation and aëration; it is the colour of used-up blue venous blood.

The quantity of residual air in houses and streets is greater than is imagined; it is always impure. Streets, therefore, and houses ought always to be so built as to admit of a thorough cleansing from this noxious medium. Streets should not only be built with due regard to the prevailing winds, but the houses should never be so continuous as not to admit of a thorough draught at certain points. Where streets are built at right angles to the current of pure air, the wind passes over them the same as it does over valleys similarly situated; the residual air is, under such circumstances, never thoroughly swept away. It is on this account that a building of a quadrangular form is the very worst for the purposes of a hospital; the same stale old air hangs about a quadrangle, and gets in through the open windows day after day, and week after week, even in spite of brisk winds. These quadrangles resemble those valleys in some parts of England, inclosed on all sides, where we find heart disease and the cause of its excess most prevalent.

The map of the geographical distribution of heart disease teaches us a wonderful lesson in ventilation on the grandest scale possible. It shows distinctly that wherever the pure fresh air from the sea can penetrate up the valleys, there the cause of the excess of heart disease is at once destroyed or swept away. The great natural ventilators of our country are our tidal rivers, whose courses are in the axis of the prevailing winds and the tidal wave; the effect of a clean sweep of sea air up these channels is well seen in the map of heart disease; for in the midst of counties whose mortality from this cause is above the average we find wherever these rivers bend that health, so far as this disease is concerned, accompanies them, the riparial districts being invariably *minus* average, or the red. To build therefore a city or a town with such a fact before us, with the streets running at *right* angles to the healthy wind current, would be to disregard the teachings of nature as we find them written in statistics. Many of our towns and cities are built upon this wrong principle, and therefore many having the natural advantages of a tidal river do not benefit from these advantage to the fullest extent. In reconstructing cities, as we are now doing, take London for instance, that ventilation ought to be one of the great objects of the scheme; no cellars as habitations, no alleys, no quadrangles, no culs-de-sac, should remain for foul air to reside in and defy the best efforts of the medical man and statesman in their attempts to improve the sanitary condition of the poor. When the old streets are demolished, the new ones that are to replace them should be planned with due regard to the points whence are derived the prevailing winds, our natural air flushers. Were we to look upon our atmosphere as we do on our seas and rivers, and water generally, we should then possess a better idea of its power as a "cleanser." Pure water washes away our solid and liquid impurities, but only in the same manner as a brisk current of the medium in which we live does our aërial sewage. We live at the bottom of an aërial sea instead of swimming about in it as the fish do in theirs, or flying about in it as the birds, and we should find that we are subject to similar currents to those in the sea, and perchance to as regular ones, if we were only better acquainted with their laws.

ALFRED HAVILAND.

GAS EXPLOSIONS.

MANY of our readers have already read of an explosion of gas at the well-known hotel near Castle Howard, Yorkshire, in which two servants had most remarkable escapes, one girl being forced nearly 40 yards. It appears the housemaid opened the bar, a large and lofty room, and lighted a fire, observing at the time a strong smell of gas. It would seem gas had been escaping all night from the chandelier, and that the upper space was fully charged. Contrary to custom, the girl omitted to open the window. She had left the room for a second or two, when, on turning into the long corridor towards the kitchen, a tremendous explosion ensued, and the girl was carried forward as fast as she could run with a sensation of an immense fire behind her right down the outer flight of steps into the park. The explosion had blown out three doors, and through all these openings the girl was carried, the outer door being thrown down the steps into the park, although 30 yards from the explosion. It is believed the accident was the result of a want of water in the slide of the pendant, which permitted the escape of gas from the top. The hotel narrowly escaped being burned.

The science of gas-lighting is one of the great improvements of the nineteenth century; but like railways and steam-engines, its practical every-day working is attended with danger. More accidents, we venture to say, occur with gas explosions than any other casualty to which the art of constructing buildings may be subjected. But, then, this ought to be understood. Every one should understand that gas is explosive. It cannot be denied that it indicates its presence in the most unmistakable manner. Still, how common it is to see an ignorant man or woman rushing with a lighted candle into a cellar or close apartment already filled with one of the most combustible combinations of chemistry? The fact is, they might just as well set fire to a powder-cask. How stale and tiresome to us becomes the repetition of the simple rule, that in the event of a strong smell of gas the first thing to be done is to *shut off the supply* at the meter, and the next, to *open the doors and windows*, and admit fresh air. There are certain more complicated circumstances connected with this particular explosion at Castle Howard, which we may briefly notice, for the benefit of those persons who may be at a distance from a gasfitter, or to whom such accidents may occur during the night; but let us point out and press on the public attention, by all means, the salutary principle, that in all cases of an escape of gas, and under any circumstances almost, a gasfitter should be sent for at once. The circumstances we refer to are these:—"The gas had been escaping all night from the chandelier," and "it is believed that the accident was the want of water in the slide of the pendant." What seems to be meant by the reporter in using the word *slide* here is what we call the water joint. A water joint in a gas lustre, it is worth while to explain, is a very ingenious contrivance. It is simply an elongated lute. It differs from a gasometer, for example, in no other principle than that of possessing a small interior tube for conveying the gas in place of a large internal cylinder, and our conviction is based upon long and practical experience, that those water-joint gas-lamps are highly dangerous instruments in almost any dwelling-house, but particularly where they are under the control of ignorant servant-girls. The recent tendencies of the gasfitting taste in manufacturing these lamps, is to reduce the size of the water cup as much as possible. Hence the whole *lute* often consists of the slender column of water that is contained between a ⅜ in. and a ½ in. metal tube! Of course this soon evaporates, especially in a warm room, and no barrier is then opposed to the escape of the deadly and combustible gas. It seems a simple precaution to pour in a little fresh water into this joint every month, more or less frequent, as the case requires. But alas! how many of our most fatal accidents arise from the neglect of simple precautions. We have found Colza oil a good substitute for water: it does not evaporate so quickly, and does not injure the apparatus by its freezing in winter, as water does. This not suiting the interests of the gasfitter, he tried to prevent us from using it, by croaking about smells and other evils; but many months have passed, and no such results have yet occurred. Even though the oil should begin to smell, it can then be easily replaced by new oil.

We may take the opportunity of adding that the same dangerous risk belongs to the gas-meters, which from the same neglect of water often permit escape. In fact, most of the explosions of gas take place at the meter, which ought to have the supply-pipes so fitted as to rise from it in a regular declivity. This would allow of the "water in the pipes," which is in fact condensed gas, to flow back into the meter, keeping at once the pipes clear, and the meter additionally supplied with water. Even then it cannot be pointed out too strongly that a systematic inspection and regulation both of gas-meters and water joints are indispensable.

THE VELOCIPEDE MOVEMENT.

IN originating this movement, as we think, every reader of the *Builder*, even for the last few years, will admit that we are entitled to say we did, our purpose was utility, much more than recreation; and, although our friends, the French and the Americans, seem to have gone crazy about it, they have not yet come up to our mark, either as regards utility or as regards improvement of the vehicle. It is to be hoped that now we have ourselves set about it in England, we shall be able to do something worth while in both of these respects, avoiding much use of the velocipede in crowded streets, and cultivating its use rather in suburban and provincial town, or country districts. One special improvement which we have all along desiderated is to get rid of the pedalizing process by the invention of some other motive power, such as compressed air; and we have before noted that in America such a power is said to have been already applied to cabs or cars; and we do not see why it should not at once be applied to the velocipede. Two-wheeled velocipedes, like "safety" cabs, are by no means safe vehicles; and, at any rate, they are not likely to survive the application of mechanical motive power to these vehicles, whatever they may then be called. Indeed, the two-wheeled velocipede is rather a retrogradation than an improvement. We do not know whether Faraday's, on which he traversed Hampstead-hill, was a two-wheeler; but at all events, the old "dandy charger," if we recollect aright, was usually so, though it was, we think, without treadles, the feet touching the ground. The withdrawal of the third or third and fourth wheel, therefore, is no novelty, although for amusement and recreation, and the display of agility and skill, it may still hold its place. On one of these two-wheelers, Mr. Mayall, jun., son of the well-known photographer, is said to have run from London to Brighton, the other day, at the rate of eight miles an hour, and part of the journey—down hill—at the rate of a mile in four minutes. This go-a-head vehicle, as the *Gentleman's Magazine* remarks, is exactly suited to American ideas, and walking, accordingly, is already on its last legs, as Yankee wags allege. Schools, with the imposing name of "Velocinasiums," for teaching the young idea how to gyrate, are being established; races are being run; and men and boys are whizzing here, there, and everywhere, at the speed of twelve miles an hour. Inventors are improving the machines, and manufacturers are making them, wholesale, the supply at present falling short of the demand. The mania is spreading everywhere throughout the States, and Western rhymers are engaged in singing the praises of the "easily-bossed" vehicle. One, Carl Benson, challenged the other day to find a rhyme for "velocipede," made it out thus,—

> "There was a man on a velocipede
> Who said, I need not give my hoss a feed:
> Without oats or hay
> He will go all day;
> It's a cheap thing to keep a velocipede."

Whereupon another poet suggests this,—

> "If 'tis a loss indeed
> To give one's hoss a feed,
> And I can boss a steed
> Of such a saucy breed,
> Then sure, the hoss I need
> Is the velocipede."

In France the mania is quite as great as in America, and the last news on the subject is that the Prince Imperial of France is at it, being a great amateur of velocipedes. He has publicly gained a race in the Tuileries Gardens against his comrade, Dr. Conneau's son, and it is said that he has ordered a dozen velocipedes to make presents of to various young friends. The French Government are about to mount the rural postmen, we hear, on velocipedes,—an idea worth consideration at St. Martin's-le-Grand.

When all the novelty-hunters are done with the velocipede, we trust that one result may be that it will be improved in the way we wish, and made useful to those who cannot afford to "keep a gig;" especially in enabling these to live healthfully in out-of-the-way corners of the outskirts of London and other large towns while obliged to be in town all day at business.

LIVERPOOL ARCHITECTURAL SOCIETY.

AT the tenth meeting of the present session of this society, held on the 26th ult. last (Mr. F. Horner, president, in the chair), thirteen sets of drawings were exhibited, which had been submitted in competition for the annual prize offered by the society to the student members. The subject was a design for a row of ten seven-yard houses, the materials for the external design being restricted to brick, tiles, and terra-cotta, except for sills or steps. It was announced by the secretary, that the council had awarded the first prize to the set of drawings marked "*Par sit fortuna laboris*," by Mr. Stanley Fox, a pupil of Messrs. Audsley; and the second prize to the set marked "Terra-cotta," by Mr. P. Balmer, pupil of Mr. Wordley. It was observed that a larger number of designs had been submitted on this occasion than had for a long time past been sent in for the students' competitions.

Mr. S. Huggins (author of the "Course and Current of Architecture,") then read a paper, entitled "Letters from Shakspearia, the new capital of Australia, written by Scamozzi Smith, esq., architect, to his friends in England, in 1915-16." This paper, which was a continuation of one read during a former session of the society, and noticed in our pages at the time, had for its aim to present criticisms on architecture and the other fine arts, in their relation to one another, and to society and social habits the criticism being conveyed in the form of descriptions of imaginary buildings in a future antipodal style. The general tendency of the paper was to inculcate strongly the revival of the refining influence of classic feeling, combined with the freest possible use of all materials which, by their colour or texture, could add any new decorative features to the buildings; and also to plead strongly for the essentially fine-art character of the architect's profession, to be exhibited not only in elevation and ornament, but also in the contrivance of plan and landscape-gardening. The paper was illustrated by a number of original and suggestive designs by its author.

BIZARRE ARCHITECTURE.

SIR,—The best thanks of all our craft who value the fine-art character of architecture are due to you for the very able and spirited article, "On some Modern Architectural Work," in the last number of the *Builder*. It augurs well for some reformation of the folly therein exposed when the leading architectural journal takes up the subject in this direct and energetic strain; and to some of us, who have by voice and pen striven in our own localities to stem the muddy torrent of false design, no greater encouragement could be afforded us than aid such as your article gives.

It is remarkable how very insensible to the vices of the styles they affect,—for simple affectation it is,—the disciples of these most corrupt schools are; for you will hear them, as I have frequently witnessed, sneer at and depreciate works not of their own kidney, but, with whatever faults, of far higher art quality, and be evidently entirely ignorant of the real merits of what they decry, and of the points in which their own cannot bear comparison with it. I lately attended an opening service in a costly church which exhibited nearly all the peculiarities you enumerate, and the architect of which, a clever and enterprising young man, had to my own knowledge desired to embody in this work all that he thought best in ecclesiastical design. Well, I declare to you that the one only feature in the least pleasing to the eye was the monogram on the Communion table-cover; all else was crude, discordant, ill-proportioned, and bizarre; yet in the local papers there appeared critiques (!) commenting with unlimited admiration on the knowledge and taste displayed by the rising young architect, and no less on the happily-directed and guided liberality of the founder.

I some time afterwards, with a lady who had accompanied me on the previous occasion, was in a neighbouring church, built more than fifty

years since from a design of Rickman's, of Tudor character and with much of what we now justly discard as past in the way of galleries, imitated material, &c. I formed a comparison in my own mind, and then asked my companion whether this or the church of the "new light" Gothic we had been at together were the more dignified architectural and ecclesiastical in effect, and she answered at once in accordance with my own feeling, the one we were then in beyond comparison; so certain is it that just proportions, well-studied detail, and carefully-designed ornament (all of which Rickman's works, as a rule, embody) commend themselves to the mind beyond all the results of affected massiveness, crude phases of form, and forced contrasts of colour which these would-be Mediæval structures exhibit; the higher artistic qualities in the earlier revival design more than compensating for the weaknesses belonging to the inherent timidity of such works. This, in the church, I have heard pointed out by the self-constituted local censors of the day as a thing only fit to laugh at: would that they possessed one tithe of the real refinement of the genial old Quaker architect! Unhappily, too, among those who run into no such excess of riot, there are not wanting some, and of metropolitan repute, who, in respect to the Pointed style, seem to act on a maxim which was often on the lips, and seemed a conclusive plea to the approval of a late eminent classical professor of our art, "The ancients did it." If only a precedent can be found for something in an old church or conventual building, it is held as beyond criticism; as if, forsooth, the Mediæval designers never made blunders. I have before my mind's eye now a lately-built steeple attached to a church, which I heard pronounced a perfect model of correct Pointed design, the spire of which (*very* like one or two old ones I have seen) if drawn by a pupil of mine of six months' standing, I should tell him to rub out and be ashamed of. But if I, here in the provinces, should venture to attach this opinion to the church and designer instanced, I should be simply covered with ridicule.

Let the real principles of art, not the popular affectations of the day, rule in the minds of those who have the duty, a noble one if well discharged, of marking for posterity the architectural position of our generation, and we shall soon get rid of the crudities, barbarities, and needless uglinesses of these unhappy caricatures of real architecture; and, whether preferring Classical or Pointed design (uniformity, I believe, impossible), they may give a character to the buildings of our day which shall hold their ground beyond it, which cannot, I believe, be the case with the class of works which, with you, I most sincerely deprecate.

A PROVINCIAL ARCHITECT.

RAILWAY MATTERS.

THE report of the directors of the Metropolitan Underground Company states that the gross receipts from traffic for the half-year ending the 31st of December last were 155,769*l*., as compared with 118,738*l*. for the corresponding half of 1867. The total traffic receipts for the year 1868 amounted to 284,243*l*. The net revenue account showed a credit balance of 150,278*l*. This balance would enable the proprietors to declare dividends at the following rates per annum, viz.: Upon the preference stock at 5 per cent.; the consolidated ordinary stock at 7 per cent.; the preferred stock at 6 per cent.; the deferred stock at 8 per cent.; and the extension stock at 6 per cent., leaving a balance of 4,167*l*. The capital account to the 31st December showed that 6,390,655*l*. had been received, and 6,486,334*l*. expended, leaving a balance of 95,679*l*. against the company. The revenue account for the half-year ending the 31st of December last showed that 162,198*l*. had been received, and 57,989*l*. expended, leaving a balance of 104,209*l*. To this was added 1,674*l*. from the preceding half-year, 14,624*l*. from the new redeemable fund account, 42,600*l*. contractors' payment, 1,250*l*. from the St. John's Wood Railway Company, and 1,796*l*. bankers' and general interest account, making together 166,153*l*. From this was deducted 15,875*l*. interest on loans, and 146,111*l*. for preference and ordinary dividends as proposed in the report, leaving a balance of 4,167*l*. for the next half-year.

The traffic receipts of railways in the United Kingdom for the week ending February 14th, amounted on 13,419 miles to 685,955*l*.; and for the corresponding week in 1868, on 13,216 miles, to 660,871*l*., showing an increase of 203 miles, and of 25,084*l*.

Extensive works have been for some time in progress throughout the entire course of the North London Railway. An additional line of rails will be added from Broad-street Station to Camden-town, passing the stations of Shoreditch, Agar-town, Dalston, Newington, Highbury, and Caledonian-road. Operations have been commenced at the Camden-town end of the line, and from this station to the Roman-road the embankment on which the rails will rest is in a more or less forward state. Beneath the Roman-road an additional bridge, with iron girders, spans the rails. The piers and abutments have been built, and iron girders will span the Great Northern line of rails, near the end of Frederick-street. The principal portion of the small brick arches between the Roman-road and Camden-town have been finished. Several houses have been pulled down in Liverpool-road and Arundel-square. Cumberland-street, lying between the Roman-road and Caledonian-road, and facing the railway, has been lined with plain new buildings of four stories; the greater portion of these are, however, yet unfinished.

The Great Eastern is able to pay a dividend of rather more than 1½ per cent.; but, "in view of the difficulties through which the company has been passing," they do not propose to pay it, but to carry the amount which would be available to divide as a reserve to the accounts of the current half-year. The Taff Vale dividend will be at the rate of 9 per cent. per annum.

A telegram from Lisbon states that the Portuguese Government is treating with one of the railway companies for the purchase of its lines.

FATAL FALL OF AN ARCH ON THE GREAT EASTERN RAILWAY.

A TERRIBLE accident has occurred on the Great Eastern. In Waterloo-town, Bethnal-green, Messrs. Lucas, the contractors, were doing some repairs for the company, and had a number of excavators and carpenters at work under one of the railway arches, which are about 60 ft. in height. A heavily-laden coal-truck passed over the spot where the men were at work, and without an instant's warning the whole structure, which was composed of brick, ironwork, and timber, fell bodily in, burying the men beneath several feet of ruins. One of the trucks in falling through capsized, and providentially was the means of saving the lives of some of the workmen. Forthwith, 100 of Messrs. Lucas's men proceeded to dig out the dying and the dead. Fourteen men were got out alive. The falling timber and iron girders had formed a sort of cavern over them. The dead bodies of five unfortunate men—four of whom were excavators, and one a carpenter—were then dug out from underneath a mass of earth. It is said that at the time of the accident one of the columns underneath the arch was being repaired, and the ironwork being weakened, the train passing over it caused the accident.

TECHNICAL INSTRUCTION FOR WORKMEN.

WE mentioned in our last that a memorial had been presented to the Earl de Grey and Ripon, by a deputation from the Workmen's Technical Education Committee. This committee was appointed at a general conference of operatives, held in London on the 14th of March, 1868. Among the suggestions made, the committee more especially solicit the favour of his lordship's attention to the recommendation, that the same systematic and detailed class-instruction which is given in the *day-time* at the Royal School of Mines in Jermyn-street, and at the Royal School of Chemistry in Oxford-street, should be given at *night*. The lectures which for several years past have been delivered in the former institution in the evenings, have been attended by large audiences of working men, and have been of the highest value. The committee feel, however, that more detailed instruction, such as that afforded by the day-classes, accompanied by demonstration and experiments, and giving the student the advantage of frequent examinations in the subjects studied, is now urgently needed, as well as the more popular survey of the physical sciences afforded by the lectures They recommend that the building where such classes are held should be an "annexe" to the Royal School of Mines and Chemistry, not far off, say Leicester-square or Golden-square. They are opposed to South Kensington, as being too distant from the residences of the majority of workmen. As to expenditure, it appears to them possible that the public might be induced to provide a site or buildings, if it were known that the State would provide all the expense connected with instruction; and if that view be adopted, the grant might be made conditional on suitable accommodation being provided.

The committee feel that it would be right and desirable that only those should be admitted to the proposed classes who are perfectly competent to avail themselves of the advantage to be derived from such classes; they therefore propose that the admission of any applicant should be rendered conditional on his having passed the lowest standard at the examinations which are held annually by the Science and Art Department, in the month of May.

COMPETITIONS.

Cemetery, Dover.—The first premium for designs for laying out ground and buildings for the new cemetery for the parish of St. Mary, Dover, has been awarded to Mr. Frederick A. Klein, of Cannon-street, London, who will be employed to carry out the works; the second, to Mr. Rowland Rees, of Bishopsgate-street Within.

Hartley Wintney New Church.—The design sent in by "Fides" (Mr. Lansdowne, of Newport and Bristol) has been accepted by the building committee; and Messrs. Hibberd & Long, of Bath, have tendered to carry it out for 3,095*l*. The plans drawn by Mr. John Johnson, of Moorgate-street, London, and those by Messrs. W. H. & J. Ward, of Curzon Chambers, Birmingham, have been awarded the second and third premiums respectively.

Lambeth Workhouse and Infirmary.—Thirteen sets of designs were sent in on Monday last for a new infirmary for 600 persons, and a workhouse for 1,500 inmates, for the parish of St. Mary, Lambeth.

Kensington District Schools.—The design by Mr. Saxon Snell has been selected. We sufficiently marked our good opinion of this plan in our brief notice of the designs last week.

Peterborough Corn Exchange Extension.—In answer to advertisements, ten sets of designs were sent in on the 17th of February. The competitors were Messrs. S. Hemming, W. Patteson, J. Wallis Chapman, and John Ladds, of London; Messrs. J. G. Traylen, Sibson, Edwin Bays, of Cambridge; Mr. J. Meggett and Daniel & James Ruddle, of London and Peterborough; Mr. B. Churchill and Mr. John Ruddle, both of Peterborough, from whose designs the directors have selected those by Mr. John Ladds, to whom they have awarded the premium, with instructions to prepare working drawings and specification, and obtain tenders at once.

CHURCH-BUILDING NEWS.

London.—The new church of St. John the Evangelist, St. George's East, has been consecrated by the new Bishop of London. The new church stands in Grove-street, Commercial-road East. It is a small edifice, built of brick and stone, in the Middle Pointed style of architecture. It occupies a site which was formerly a cooper's yard. The church contains about 600 sittings. It has been erected at a cost, as computed by the architect, of 4,300*l*.; although, all things included, the entire expense would amount to a considerably larger sum. The money has been subscribed partly from the Bishop of London's Fund, and the remainder from other sources. The Messrs. Francis were the architects.——A new church is about to be erected for an ecclesiastical district, consisting of the neighbourhood of Brownswood Park, to be taken out of the parish of Islington. The church will be dedicated to St. John the Evangelist.——Another new metropolitan church has been completed. It is situate in Barnsbury, and the district which is assigned to the new church is taken out of the parish of St. Luke, Holloway.

Bromley (Middlesex).—The church of St. Gabriel, Bromley, Middlesex, has been consecrated. The district assigned to the new church is taken from the parish of St. Michael, Bromley. It has a population of 7,000 of the poorer classes. The edifice has been built from the designs of Mr. R. J. Withers, by Messrs. Dove, Brothers, at a cost of 4,700*l*., of which 2,000*l*. were given by the Bishop of London's Fund, the Church

Building Society, &c. It affords seats for 758 persons, all free.

Hitchin.—King's Walden Church, which has been closed for the purpose of being repaired and restored, has been re-opened for divine service. The church has been reseated with benches of polished oak, and the reading-desk is also of oak. The pulpit and font are of stone, carved. The oaken screen, which divides the nave from the chancel, has been restored and redecorated. The works have been carried out by Messrs. Forsyth, of London, from the designs of Messrs. Nesfield & Shaw. An organ, built by Messrs. Waller & Jones, of London, has been put up. It is proposed to insert a painted east window, and to introduce colour in the roof and on the walls of the church.

Fulbourne (Cambs.)—The parish church is to be restored by Mr. Tooley, of the "Church Restoration Works," in this town, his tender for the work, 3,100*l.*, having been accepted. Mr. A. J. Blomfield is the architect engaged.

Birmingham.—There is a prospect of a church being erected for the populous and daily-increasing district of Heath-street, in the parish of All Saints. The inhabitants being at a great distance from any church, have taken up the matter warmly, and the Church Extension Society have already purchased a piece of land at the junction of Heath-street and Winson-green-road, for church and parsonage, and made a grant of 500*l.* towards the erection of the church. A building committee has been formed, and plans for the church, which is to be called St. Cuthbert's, have been prepared by Messrs. Bateman & Corser. Estimated cost, 5,000*l.*

Ripon.—The chapel of St. Mary Magdalene has been consecrated. This edifice, which is from the designs of Mr. Crosland, architect, Leeds, has been erected through the liberality of Mrs. Mason, the widow of the late Rev. G. Mason, of Copt Hewick Hall. The old chapel, situated not far from the River Ure, contains an ancient pavement in front of the altar, supposed by some to be Roman, but more probably copied from a work of that period, of the date of the twelfth century. The new chapel contains two stained-glass windows, both to the memory of the late Rev. G. Mason. That in the east, representing the six Beatitudes, by O'Connor, of London, was the gift of Mrs. Mason; and that in the south, representing the three Graces—Faith, Hope, and Charity—was got up by subscription among a few friends of the late rev. gentleman. The chapel will hold about 150 persons.

STAINED GLASS.

St. James's, Derby.—The chancel of this church has recently been enriched by the insertion of seven stained-glass lancet windows, each of which is divided into three compartments. Six of the lights illustrate those suffrages in the Litany which relate to the Saviour's Redemption, and the most important events in His life, beginning with the Nativity and concluding with the Ascension and the Descent of the Holy Ghost at Pentecost. The seventh light is devoted to the Martyrdoms of St. Stephen, St. John, and the Holy Innocents. The artists were Messrs. Lavers, Barraud, & Westlake, of London.

The Abbey Church, Bath.—A stained-glass window by Mr. Hughes, of London, has been placed in the south aisle of this church by Mrs. Brooke, of Malmesbury, in memory of her eldest son. The window contains five subjects, viz.,—The Raising of the Widow's Son, Our Lord addressing the Nobleman and telling him that his Son liveth, Christ receiving little Children, the Prayer in the Garden and the Sleep of the Disciples, and the Payment of Tribute Money. At the top of the window (which was exhibited at the Paris Exposition) are figures of angels bearing banners, on which texts are inscribed.

Marple Church.—A stained-glass window has been placed in the east end of All Saints' Church, Marple. On the upper part are representations of three angels, and near to them appears the word Alleluia, which is twice repeated, as though forming part of an angelic song. On the left-hand side of the central compartment is the representation of the Baptism of Jesus by John the Baptist. On the right-hand of the compartment is the representation of Our Lord's Last Supper. In the centre compartment is the representation of the Saviour's Ascension. This is the first stained window erected in Marple Church, and is placed there by the eldest daughter of Mr. Skirrow, as a tribute of affection to her parents. The window is from the establishment of Mr. Hughes, of London.

Chichester Cathedral.—We understand that the erection of a new window of stained glass in the south transept of this cathedral has been intrusted to Mr. Wailes, of Newcastle-upon-Tyne, and that it will be immediately taken in hand.

Great Barford Church.—A stained-glass window has recently been put up in the chancel of this church. It is dedicated to the memory of the late Mr. John Arnold, who, on retiring from business as a London merchant, built a mansion in this parish, and here spent the latter years of his life. The window was designed and executed by Messrs. Hardman, of Birmingham.

PROVINCIAL NEWS.

Chatham.—A new wing is to be added to St. Mary's Convict Prison, Chatham, which will accommodate about 300 more convicts. Employment could be found on the dockyard extension works at St. Mary's Island for even a greater number.

Liverpool.—The new offices of the Liverpool and London and Globe Insurance Company, erected at a cost of 11,500*l.*, in Corn-street, are now completed and occupied. The architect was Mr. W. B. Gingell. The public office is a large room, with plastered roof, supported on columns of coloured stone. There are three suites of professional chambers over the company's office.

East Retford.—The first stone of a new Temperance-hall has been laid here. The building will be 54 ft. by 22 ft. inside, and of a plain character, and is estimated to cost 360*l.*

FROM AUSTRALIA.

Melbourne.—The church of St. Mary's, Hotham, of which the *Illustrated News* of Melbourne gives an engraving, has been opened for divine service, after being enlarged by the addition of transepts and chancel. The style of the building is Gothic, of the Early Decorated period. Its external length is 112 ft., and across through the transepts it is 104 ft. The plan is cruciform. It consists of a nave, with north and south aisles (the portion of the building already in use), north and south transepts, chancel, baptistery, robing-room, and vestry. The church is constructed throughout of bluestone, with freestone mullions and tracery in the windows, and with Portland cement water-tables to the buttresses, &c. Each gable is terminated with a freestone cross or finial. The nave is a clearstory, and is lighted by windows of circular form, filled in with tracery, and situated above the aisle roofs. At the intersection of the nave, chancel, and two transepts, there are four moulded stone arches, 24 ft. wide and 32 ft. high, the space which they enclose being finished with a groined ceiling, with moulded ribs, having carved bosses at their intersections. This ceiling, which hangs like a canopy over the space where the nave, chancel, and transepts meet, is one of the chief of the internal features of the building. All the other parts of the church have open timbered roofs, with moulded hammer-beams, and carved struts thereunder, springing from moulded brackets. The seating-room, when the whole of the interior fittings are completed, will afford accommodation for about 800 persons. The cost of the building so far, has been over 6,000*l.* The tower and spire, which will be 130 ft. high, as yet have only been commenced; and before the whole church is completed an organ-loft and organ will have to be built, as well as interior fittings and stained-glass windows added. At the eastern end of the chancel there is a large window, 12 ft. 6 in. wide by 25 ft. high, intended for a stained-glass design; and it is understood that a local firm have offered to design and manufacture the window for the sum of 400*l.* The architect was Mr. Lloyd Tayler.

The contractor for the Kew Lunatic Asylum has commenced operations. A large number of men will be employed in the erection of this extensive pile of buildings.

The contractor for the Alfred Graving Dock, Williamstown, has between seventy and eighty men at present employed on that work.

The new Yarra Graving Dock, built by Captains Sinnott and Hughes, has been opened. This dock has been in course of erection for the last two years. The length of the dock is 250 ft., breadth at top 55 ft., and at the bottom 40 ft. It is 16 ft. deep in dock, and has 13 ft. 3 in. of water on the sill at ordinary tides. The pumping machinery consists of a 20-in. centrifugal pump, capable of raising 5,000 gallons per minute, and was manufactured to order by Mr. William Wright, of Little Bourke-street West. Mr. D. B. Pritchard, C.E., of this city, is the consulting engineer.

FROM SCOTLAND.

Edinburgh.—The Lords of the Treasury, according to the *Scotsman*, have sanctioned the erection of a large new Record Hall, on the vacant ground at the back of the old building, at a cost of about 8,000*l.*, the designs for which have been prepared by Mr. Matheson, of her Majesty's Board of Works. This increased accommodation for the records is rendered necessary by the Land Writs Registration Act of last session.——The directors of the Edinburgh Water Company have received a report from Mr. Hawksley, the hydraulic engineer, and from other engineers, pronouncing in strong terms in favour of the Company's scheme for bringing in a supply of water from the Moorfoot Hills. Mr. Hawksley estimates the cost of the St. Mary's Loch Scheme at 1,400,000*l.*

OBSTRUCTION OF PICCADILLY.

A CORRESPONDENT, T. H. H., whose letter represents two others on the same subject received by us, says,—The intrusion of a solid brick erection, measuring 27 ft. by 15 ft. and 20 ft. high, completely across the footway of Piccadilly, induces me to inquire whether there is any local authority to protect a public thoroughfare of such importance.

Opposite to the site which is now being excavated for the new buildings for the scientific societies opposite Burlington House, the hoarding covers the whole footway, which is 12 ft. wide; but in the centre there is a further obtrusion of 5 ft. upon the driftway, and a close porch, which has all the appearance of permanence, projects to the curb; thus cutting off the view of the street line, reducing the carriage-way in this most important street, and necessitating a railed gangway, by detour, for pedestrians.

It may be alleged that the long corridor erected as an entrance to the Royal Academy, through the old courtyard, is only temporary; but it is likely to stand in the way for some years, until the new building is complete, to the annoyance and discomfiture of the public.

The architectural effect of this extemporaneous bit of luxury is by no means contemptible; nevertheless, for public use and convenience, it may not be unreasonable to ask that in case a *velum*, or carriage awning, be absolutely requisite for Fellows or Patrons, a pair of pillars only be reserved on the curb to sustain the roof, and that *the traverse walls be removed*, so as to afford free intercourse for pedestrians on this the most important of our West London pavements.

WIDENING THE POULTRY.

SIR,—Nonsense! Abolish the Poultry. Surely they are not going to finish off the end of the new street from Blackfriars to the Mansion-house, and then see what a ridiculous appearance a "Middle-row" left will make.

Here must be the programme. Abolish the Poultry! Let Cheapside be lengthened to the Mansion-house. ONLY A TAILOR.

"MEDIÆVAL METAL CAPITALS."

For the benefit of your correspondent "T. M." I would instance the case of Salisbury Cathedral, where the centre shaft of the west doorway has to its capital a bronze abacus. The section of the abacus is the same as the stone abaci on either side of it.

The bronze bands of Salisbury and the copper bands of Westminster are well known; while doubtless many other examples exist to ease the mind of "T. M.," who appears desirous of making such legitimate use of metal, but is anxious to find a precedent. J. T. P.

SIR,—In reply to "T. M.," I think if he will make inquiries, he will find many instances of Metal Capitals in ancient and modern times; to wit, the Pantheon, and St. Peter's (interior), Rome; Nelson Column, London. S. C. F.

THE PROPOSED NEW OFFICES FOR POPLAR DISTRICT.

AT a special meeting of the Poplar District Board of Works, held last Tuesday evening, at the Board-room, East-India Dock-road, a report was read from a committee, to whom had been referred the four lowest tenders for the erection of new offices and Board-room. The four tenders were,—Mr. Kilby, 8,112*l.*; Messrs. Wicks, Bangs, & Co., 7,975*l.*; Mr. Turner, 7,890*l.*; Messrs. Baker & Constable, 7,330*l.* The committee recommended that Messrs. Baker & Constable's tender be accepted. An amendment, to the effect that the tender had exceeded by about 2,330*l.* the original sum intended to be laid out, was moved, seconded, and persevered in; and after a protracted discussion the Board divided, and the amendment was lost by a majority of eight. A second amendment was then proposed and seconded, that the matter be referred back to the committee, with a view of reducing the sum to be laid out. This amendment was also lost. The report of the committee was then carried, and Messrs. Baker & Constable were informed that their tender had been accepted by the Board. The joint architects are Messrs. Hills & Fletcher, and Messrs. A. & C. Harston.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE President, Mr. W. Tite, M.P., announced at the last meeting of the Institute, held on Monday evening, the 1st inst., that the council proposed to recommend for the Royal Gold Medal of 1869, Professor C. R. Lepsius, archæologist, of Berlin. The recommendation would come more formally before them at another meeting. Mr. Alfred Strong was elected a fellow, and Mr. W. F. Williams an associate; and then Mr. Wyatt Papworth read a memoir of the late Joseph Bonomi, architect and A.R.A., with a description of some of his designs. A number of Mr. Bonomi's drawings were exhibited.

Mr. Geo. Godwin read a paper on Masons' Marks in various countries, with special reference to the Chevalier Da Silva's work, "Signes qu'on voit gravés sur les Anciens Monuments du Portugal." The paper was illustrated with 48 sheets of marks from Egypt, the Holy Land, Lycia, Italy, England, Ireland, Scotland, France, the Tyrol, Switzerland, Sweden, Denmark, Germany, Austria, Spain, Portugal, and other countries. We shall print it hereafter.

THE ARCHITECTURAL EXHIBITION.

THE annual exhibition will be opened on Wednesday, May 5th, and drawings must be sent to the galleries on Monday or Tuesday, the 5th and 6th days of April. The council desire to give to the architectural profession, and the public at large, a creditable and convenient opportunity of exhibiting and inspecting well-executed representations of the work now being executed by individual architects, and others interested in art. In furtherance of these objects, and in addition to the usual attractions of the exhibition, they are desirous of receiving perspective, geometrical, and working drawings of all new buildings, with such particulars as to plan, construction, cost, draughtsman, or artist, as may be desirable. The committee have also decided upon accepting a limited number of purely artistic drawings of architectural subjects. To bring the exhibition into prominence, it has this year been decided to open it free on Mondays and Saturdays.

CABINET-WORK IN LONDON.

SIR,—Your correspondent "E. G." gives a very fair sketch of the majority of the cabinet-makers in London, but he does not show that the remarks made by the Marquis of Bute were justified.

I understand that a statement was made by the noble marquis, to the effect that "there was not a man in England capable of designing a piece of cabinet-work; and if a good design were procured there were no men able to execute it." This is a sweeping charge of incompetency to bring against designers and workmen by a young and—I feel justified in saying—inexperienced nobleman. In a few years he may think that he came to a hasty conclusion on this matter, and retract it. He has not, I believe, been in many of the best houses in London or the provinces, where really good designs for furniture are made and carried out; for, if he had, I think that he would not have made such assertions. These houses rarely advertise, and they are not much known outside their *clientèle*; but they manage to keep a quiet and even course.

One thing your correspondent "E. G.," in his able letter, has not alluded to, is the great number of respectable houses in the upholstery, carpet, and antique furniture trade, that sell furniture, but do not make it. These firms procure good drawings, and give them out to a cabinetmaker, who undertakes to make the piece of cabinet-work for a certain sum, and they do not look to the quality of the work so much as to their full profit; therefore they are satisfied if their customers pass the work, and pay the bills. Yet there are some houses where the furniture is made on the premises under the supervision of the proprietor and designer (very few proprietors can draw), and some furniture is designed by our best architects and artists, and such furniture may be put in competition with that made by any house in the world.

Plain cabinet-work is made in these workshops, and it is as good as men can make, but the price seems high for it when compared, by an inexperienced person, with that made to sell only.

As a furniture and upholstery salesman, I have had to do with the designer, maker, and purchaser; and I consider the cause of so much bad furniture being made is the fault of the latter; for, if the purchaser would be content with a neat and simple piece of furniture free from a quantity of wretched carving and inlay or marquetrie, satisfaction to purchaser and maker would be the result. J. S. B.

SOUTH LONDON WORKING CLASSES INDUSTRIAL EXHIBITION.

ON Monday last the third South London Working Classes Industrial Exhibition was opened at the Lambeth Baths, the same building in which the two former were held, in the years 1864 and 1865. The exhibitors are mainly of West London, and the working-classes. The number of exhibitors is 450, and of these there is a much larger proportion of skilled workers than in any previous industrial exhibition. The adjudicators, the space committee, and a vigilance committee, have been chosen by the exhibitors from among themselves; and, in consequence of the pecuniary success of the exhibitions of 1864 and 1865, it was thought unnecessary to form a guarantee fund. The adjudicators have awarded the prize of 5*l.* for the best design for a medal to Marian B. Brook; and that of 2*l.* 2*s.* for the best design for a certificate to Helen J. Arundel Miles. Mr. S. Morley, M.P., presided at the opening ceremony, and Mr. Goschen, the Lord Mayor, and other gentlemen addressed the meeting.

TIMBER YARDS.

THE late fire in the timber-yard, King-street, Clerkenwell, and its disastrous effects upon some poor tenements, whose tenants were wholly *uninsured*, again points to the necessity, so often urged in your pages, of placing these timber-yards under strict supervision, restrictions, and regulations.

No timber should be allowed to be stacked against adjoining dwelling-houses, nor within a distance of 30 *feet* of the external, flank, or other wall of any adjoining dwelling-house. By this regulation, timber-yards could only be made in fit and proper situations.

THE DISTRICT SURVEYOR.

A SANITARY GRIEVANCE.

THE following letter to the Board of Guardians of Sligo caused some laughter, it is stated. Let us express a hope that it nevertheless awakened attention:—

"Collooney, February, 6, 1869.

I most respectfully beg leave to state, for your information, and the information of the whole board, there is a large heap of manure, the concentrated essence of Mr. Sim's whole concerns, within four yards of my kitchen door. I am an 'unprotected female.' I mean by that, gentlemen, I have never been married. I live by my industry, so far as keeping an eating-house. A very respectable farmer called in here a few days ago for refreshment; but in consequence of the scent of Mr. Sim's dung-pit up to my door, says he, 'Katty, I cannot take the second cup of tea.' Gentlemen, I do not want to take any law proceedings against Mr. Sim, but I want him to leave me what the Great Being left the whole human species—the air.—I have the honour to be, your very humble and obedient servant,

CATHERINE M'DONOGH."

THE TREATMENT OF SEWAGE.

SIR,—In these times of sanitary improvement many ideas spring up in people's mind as to the best and most economic plan of disposing of the sewage of our towns; and having had many occasions to study and think about it, I have now attempted to bring my thoughts to a practical termination, and trust the following ideas may be profitably imparted.

The ordinary plan of draining our towns into the neighbouring rivers and streams will not be any longer permitted.

Sewage works have been established, but sufficient pollution is allowed to escape into the neighbouring rivers and streams, to establish cause for Chancery suits, &c. Earth closets have been made and talked about, but are not without many and grave objections.

The plan I propose to adopt is, that in large or small towns the drainage should all be carried or conducted to depôts or sewage works. Two or three might be erected (according to the levels and size of the town) in different outskirts. These works would be very inexpensive, and made to be worked on the same principle as earth closets. There would be no annoyance worth mentioning, either in its collection or distribution. Every purchaser of the manure should be compelled to bring a certain quantity of earth, so that the supply would cost nothing; and I have no doubt such manure would meet with a ready sale and pay well. GEORGE SMITH.

Northampton.

CLOSED DOORS AT SOUTH KENSINGTON.

SIR,—Being interested in the description of the Kensington District Schools Competition in your journal last week, I went to the Horticultural Society's Buildings on Saturday last, hoping to see the drawings referred to. I was informed that it was necessary to have a ticket from a certain Mr. Brown; but that gentleman not being in the way at the time, I and a friend who was with me were refused permission to enter the Council-room, where I understood from your remarks the drawings were visible.

Having gone once before to South Kensington to see some asylum district drawings, but being also then unsuccessful, I desire to call attention to the exclusiveness, if I may say so, of the authorities in these matters—exclusiveness which, as applied to the competition itself, you have already commented upon with effect.

Again, may I urge the hardship—and it really amounts to this—of closing the South Kensington Museum against the public at four o'clock on Saturdays?—a time when of all others it is most desirable to have it open. If Mr. Cole could have seen the troops of people of all sorts, old and young, interested in the armour and other things, when the bell was rung at four o'clock last Saturday, and heard the expressions of regret at such a bright opportunity (for the sun was shining brilliantly) being lost for seeing more of the treasures being then locked up, he would have relented, I am sure, and stuck up a notice at once to the effect that on the next Saturday the doors would remain open till SIX o'clock at least.

When it is remembered how few, even with their Saturday half-holiday, can reach South Kensington before four o'clock, even with the railway advantages now available, it seems simply absurd for a popular institution to close its doors at that hour. ONE "DISAPPOINTED."

HARD A-STARBOARD.

SIR,—Electricians inform us that they can communicate across a wide lake, water alone being the conductor, the electric current being received on a broad copper shield, with a wire attached, for further transmission. This has led me to think how collisions at sea might be avoided from fast-going steamers dashing into each other on foggy nights, thick weather, inattention, &c.

The "paths of the sea" are laid out and kept with exactitude; thus they often meet, "passengers' dread and owners' bane," with frightful results. My plan is to have a battery constantly sending forth currents of electricity from the cut-water, to be received, and *fire a gun*, on board of any high-speed steamer that may be direct in her path, to indicate danger, and for *one* to alter course instantly.

It is recorded of an American mail steamer that made a quick passage from New York, a dense fog prevailed during the whole of the passage: they kept most accurate reckoning. When they shut off steam they were only a few yards from the Formby lightship, off Liverpool. Is not this pushing on risky? If protection can be devised the inventor must look for his reward in pence from "Jack," and his kinsmen, for I well know the Government will not recognise nor pay for anything of this kind, if invented by a poor Samaritan, but it is reversed if it is one of their own Salamanders. R. T.

BILLS OF QUANTITIES.

SIR,—As the question of payment for quantities is being discussed in the *Builder* from week to week, I make no apology for asking you, in the interest of all concerned in the erection of buildings, to give publicity to the following statement:—

A few months ago I sent a well-known firm of London architects a tender prepared upon bills of quantities which they supplied at a charge of 2½ per cent., in addition to other charges all included in the estimate in the usual way. I was informed that my tender was the lowest, and asked to wait upon the architects, who said they could not take any responsibility upon themselves; but, if my tender was accepted, I must myself verify the quantities within a fortnight after signing the contract. To this I consented, and intimated my intention of making a full examination of the drawings and specifications. Need I add my tender was not accepted. Surely a builder has enough responsibility and risk, without having a surveyor's liability thrown upon his shoulders, to enable an architect to pocket an extra 2½ per cent. A BUILDER.

BEHAVIOUR OF CEMENT.

SIR,—Can any of your readers inform me the reason why brick piers, say 7 ft. by 4 ft., built with Portland cement, after completion, begin to open in the *horizontal joints*, as if laid with hot mortar? The piers were well weighted on top. If any reader will give me the information required, he will much oblige

B., Builder.

GAS METERS.

SIR,—A correspondent complained to you for having to pay for a quarter's gas that he did not consume. Your correspondent and others have themselves greatly to blame for not looking after their own meters, and keep the quantities consumed, and not trust to the inspector altogether; for we know they are not a very well paid class of officials, and very often not the most intelligent. And since gas was first introduced for domestic use the principle has never altered, that is, of putting the gas meters under the kitchen sink, or some other filthy or out-of-the-way place.

Now, Mr. Editor, can you tell me why a gas meter should not be as ornamental as a timepiece in our lobby or rooms? It is not a matter of necessity to pack the works in the unmechanical and unsightly box they are now packed in. I see nothing to hinder them from being made ornaments for the finest houses, especially where there is plenty of accommodation. A tablet could be put up to show a timepiece, a gas meter, a barometer, and many other useful indicators. By having such arrangements in a house, the family would learn to read and know the use of the whole of them; whilst at the present time there are not ten out of every hundred can explain them. A. F.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE second annual meeting of the members of this young and rising Society was held on Wednesday evening, the 24th ult., at the Offices, 14, Bedford-row, Mr. Charles Richardson in the chair. The attendance was small.

Mr. Richardson, the president of the year, opened the proceedings by calling upon Mr. Mullett, the secretary, to read the report. That document congratulated the subscribers on the advancing character of the institution, and stated that the annual meeting had been changed for the convenience of members from August to February. In alluding to the falling off in receipts for the past year, as compared with the previous one, it was stated that many donations were always given at the starting of a new society which would not be continued; and reference was, also, made to the financial crisis of 1866 as being injurious to the income of the succeeding years. Since the last meeting three healthy men, leading clerks in London, have been removed by death, and their loss is much regretted. There have been purchased 600*l.* stock in the 3 per Cents., an available balance at the bankers', and two widows have been placed on the pension list. In announcing the presidency of Mr. Richardson, the report passes a high eulogium on the retiring president, Mr. Henshaw, "for the very generous manner in which he has devoted both time, means, and influence towards advancing the interests of this young institution." Notwithstanding the discouraging aspect of the year, the results to the society have more than realised the expectations of the committee, and the continued support of friends and members is earnestly asked for.

THE balance-sheet stands as follows:—To the 30th of July, 1867, 477*l.* 11s. 5d. Subscriptions and donations, 286*l.* 4s. Interest on banking account, 6*l.* 0s. 3d. Total, 769*l.* 15s. 8d. The expenditure gives, for rent, stationery, printing, postage, secretary's salary, and all working costs, the sum of 95*l.* 4s. 5d. Relief and pensions, 12*l.* 15s. Purchase of 630*l.* 3 per Cents., and broker's commission, 561*l.* 15s. Available cash, 100*l.* 1s. 3d. Total, 769*l.* 15s. 8d.

The Chairman, in moving the adoption, printing, and circulation of the documents just read, took occasion to congratulate the meeting on their success. Theirs was a young society, only just started, and started, too, at a very bad time, when trade and commerce were dull. He hoped that the last wave was rolling over us, and that better times were to come, and that they would all put their shoulder to the wheel. Builders' clerks wanted something of that kind; they often worked in offices that were not always healthy, and they did not get enough of out-door exercise.

The report having been adopted, resolutions were passed appointing the committee and officers for the year; and a special vote of thanks was passed to Mr. Hannen.

A conversation ensued as to the best means of inducing builders' clerks to take an interest in the society.

VITRUVIUS.

SIR,—As there is a disposition to afford a better professional training for those who purpose following the profession as architects, it has occurred to me that, supposing that any professor would take up Vitruvius as a basis, and deliver a course of lectures, using that book as a guide, commencing with the essentials of an excellent and good practical education in the first instance, and then follow the same course as laid down by the above talented and experienced great man, with all the improvements and changes which have taken place in nearly 2,000 years, the lectures or papers would form a most valuable nucleus for the young architect, laying down what system he should adopt, what works to study for theory or practice, the nature and improvement in all matters relating to building, their nature and properties, not confining himself to the mere routine of an architect's office, which he should never enter till he has been well grounded in drawing, &c.; and as it is now proposed that he should, like the ancient masters, have a knowledge of the figure in drawing or modelling, and also in painting and sculpture, sufficient to be a guide to him in future life; and he would have much reason to be thankful to such a professor for his excellent advice in forming his mind, and rendering him in after-life an ornament to society.

I am merely throwing out these few hints as a stepping-stone for others to follow up in their better judgment. A SUBSCRIBER.

PROPOSED NEW BUILDINGS ACT.

SIR,—As it is proposed to revise or replace the existing Act, let us hope that it may be made applicable to the provinces, or that suitable clauses may be inserted for this object. I have no doubt that most architects in small towns will agree with me, as will any one who has witnessed what I have.

We can most of us remember the great fire in West-street, Gravesend, in 1846, when the whole of that weather-boarded substitute for a street was destroyed.

I was once offered a three-story house in a town of 20,000 inhabitants for 160*l.* The front wall was 9-in. brickwork, the back wall 6-in. brick on edge, the party walls represented by quarter partitions. No W. C. or privy. Sashes all single hung. I on another occasion designed a pair of cottages for a country builder, who insisted on a wood partition between the two houses; and not only this, but at one part a party *floor*, not fireproof. On my remonstrating, he merely replied, "That he was going to insure the houses."

If a general Act is carried out, I must suggest a word of caution against local officials; for experience tells me that unless our counties are treated—at least, in this instance—*as departments*, the Act would be useless. W. S.

THE present Act is ill-defined and indeterminate in point of law. We have simply to revert to the Act of 1844 as a *model Act*, and one that can only be in form improved by the introduction of a "Metropolitan Buildings Court," with summary jurisdiction, three architectural referees, and a legal assessor. In substance it is a most ably-drawn Act, and is singularly enough appealed to whenever a correct definition is required. This tribunal should be a final Court of Appeal, and independent of any other body. All these changes are productive of great inconvenience. A. D. S.

THE DISCOVERIES AT GUILDFORD CASTLE.

AT the risk of diminishing the romance which attaches to the discovery of the so-called "dungeons," I would suggest that the caverns now opened were once quarries, from which the supply of chalk was obtained for use in the various buildings, and notably in the interesting Church of St. Mary hard by, restored under my direction a few years since, in which the columns and arches and mullions and tracery of the windows were found to be of chalk, with Reigate fire-stone in parts. The harder chalk would be found at some depth—hence, probably, the extent of the excavation. There are three varieties of chalk in the neighbourhood of Guildford, viz., white chalk, grey chalk, and the beautiful veined chalk which has the aspect of veined marble when varnished. Chalk, however, is little used for building purposes in this Bath-stone age, but for interior use, especially above the line of wear, I think it is a very beautiful and tractable material, taking a good arris and hardening with age. The lime burnt in the neighbourhood is justly celebrated. THOS. GOODCHILD.

Books Received.

Practical Remarks upon the Principle of Rating Railway, Gas, Water, and other Companies, Land, Buildings, &c. By CHAS. PENFOLD. Fifth Edition, rewritten by JOHN THOMAS KERSHAW. London: Knight & Co., Fleet-street. 1869.

A TIME is coming when a vast deal of valuation and re-valuation must be done, so that the appearance of this new edition of "Penfold on Rating" is opportune. Mr. Kershaw, who is one of a well-known firm of rating surveyors, and brings practical knowledge to the work, has extended the original book to make it include the effects of Acts of Parliament passed since the previous edition appeared. The present editor has a strong opinion as to the liabilities of companies, and has brought together cases that bear on this point. We can recommend the volume to all who are interested in the matter.

VARIORUM.

WE need but announce the appearance, as usual, of "Debrett's Peerage for 1869," and "Debrett's Baronetage for 1869," now published by Dean & Son, Ludgate-hill. Great care is evidently taken to keep these works up to the time, and to maintain their ancient reputation. ——Mr. Hardwicke publishes a "Shilling Peerage," a "Shilling Baronetage," a "Shilling Knightage," and a "House of Commons 1869," also for a shilling. The fact that these are all edited by Mr. Edward Walford, M.A., sufficiently guarantees their correctness, so far as they go. ——"The Railway, Banking, Insurance, and Commercial Almanac for 1869," edited by Mr. W. Page Smith, which reached us somewhat late in the year, contains its usual large amount of information connected with the interests it addresses.——*Fraser's Magazine* for March, contains "A Note on Pauperism," by Florence Nightingale, which may be most usefully studied. Miss Nightingale's proposition as to the punishment of prisoners is less likely to meet with acceptation.——*Britannia*, a monthly magazine, has the advantage of being edited by Mr. Arthur A'Beckett, and illustrated by Mr. Mat. Morgan. ——The current number of the *Broadway* contains an appreciative paper by Mr. William M. Rossetti, entitled "Ruskin as a Writer on Art." ——The first Annual Report of the Amalgamated Society of House Decorators and Painters, from April, 1868, to December, 1868. Kenny, Printer, Camden-road. This society was established in April, 1868. The general secretary, Mr. G. Shipton, in his report, or remarks, says,—

"Our report for the quarter ending September showed there were 389 members in the society, fifteen of whom had joined under the full force of the rules; and after deducting the cost of sufficient property to start twenty-five branches, and the working expenses of the society, we were left with a balance in the general fund of 41*l.* 4s. 6½d., or an average of 1*l.* 1s. 5d. per member. Thus it will be seen that nearly the whole of the members became free to all benefits beginning with October, placing before us the worst period of the year. In addition to this, the sad depression on all branches of industry—of course including our own—made matters still more against us, and altogether likely to test the solidity of the society to the fullest possible extent.

Now, the lowest sum for which any member can join the society under the rules, before being free to all benefits, is 3*l.* 0s. 10d.; this ranges, according to the age of the member, up to 4*l.* 8s. 4d. Thus the many disadvantages under which the society was started will be evident, as upon the lowest payments the sum of 1,167*l.* 5s. 9d. would have been realised."

"During our short period of existence, the total income of the society has been 844*l.* 16s. 3½d., and our expenditure for property, working expenses, and payment of benefits amounts to 553*l.* 13s. 11½d., leaving a balance of 291*l.* 2s. 4d. in December. For funerals we have paid 10*l.*, or an average of 6½d. per member; for sick benefit, 40*l.* 6s. 2d., or an average of 2s. 1½d. per member; and for the all-important object of providing sustenance for our unemployed members, no less than 273*l.* 5s. 3d., or an average of 14s. 7d. per member."

——Liverpool Institute: The forty-fourth Annual Report of the Directors, January, 1869. Marples, printer, Lord-street, Liverpool.—This report congratulates the members upon the prosperous condition of all departments of the Institute. Various suggestions as to technical education have been carried out practically in the classes of the Institute. The report says as to the Government School of Art:—

"Under the energetic management of Mr. Finnie, this school is steadily advancing, and it is hoped that the more liberal regulations of the Government Art Department will cause an increase, both in numbers and efficiency."

"At the Second-Grade Examination, held in March, 180 students were examined, of whom 88 worked 108 drawings, and received certificates, and 21 were awarded prizes for excellence. This shows an increase, as compared with 1867, of 23 students who sat for examination, and of 26 certificates and 9 prizes. The inconvenience of the late hour appointed for candidates still exists, and prevents the members of the ladies' class competing.

Seventy students sent advanced drawings to London. Money awards were made upon 26; 7 received prizes of the Third-Grade, and 1 received honourable mention. Two drawings were also selected for exhibition at South Kensington."

——The twenty-third Annual Report of the Council of the Crewe Mechanics' Institution. Crewe: Eardley, printer. The council give a satisfactory report of progress. There are science and art classes in connexion with the Government Science and Art Department. In the art division Mr. Turnbull is the teacher of geometry and of perspective; and in the science division Mr. Caister is the teacher of building construction.

Miscellanea.

Danger from Gaselier Brass Chains.—Correspondents of the *Times* have been drawing attention to the risk of the brass chains of gaseliers giving way, and the weights falling off. Brass is liable to become brittle, as indeed other alloys occasionally do; and it is recommended that chains of copper should be substituted. Brittle brass, it may be noted, can be made tough and flexible again by annealing; and all brass is not equally liable to become brittle. Brass wire submitted to occasional vibration, while stretched, will sometimes become tender and brittle in a few weeks. Copper, it seems, is far safer than brass for chains.

Street Tramways for South London.—A meeting in support of the attempt to obtain Acts of Parliament for laying down tramways, especially in the south of London, has been held at Kennington. Mr. G. Hopkins, C.E., explained the plan more particularly supported, including lines to Westminster, Southwark, and other bridges, from different points in the south of London. It is proposed also to connect Lambeth with Battersea Park, and Pimlico with Peckham and Greenwich. The maximum charge by the bills in Parliament would be 1d. per mile. The plan under consideration was heartily approved of, and a petition in its favour resolved on.

Park-lane Improvements.—A communication was received at the last meeting of the Metropolitan Board of Works from the Hon. C. A. Gore, Commissioner of Woods and Forests, in reference to the proposed improvement of Park-lane, and for which a bill is now before Parliament. Mr. Gore said he had consulted the Lords of the Treasury, and had prepared clauses for insertion in the bill for securing that proper compensation should be paid to the Crown and to the lessees and tenants of the houses and buildings in Hamilton-place, not only for the property which may be taken, but also for the diminution in value of the houses in Hamilton-place in consequence of its being converted into a thoroughfare, whether compensation is or is not payable in this respect under the Lands Clauses Consolidation Act, 1845. This letter led to an animated discussion, in which it was strongly enforced that no exception should be made in favour of the owners of this property over what was given to any others whose property was required for public improvements, and especially so as Mr. Gore had thrown every obstacle in the way with respect to the formation of the Thames Embankment. The letter was referred to the Works and General Purposes Committee.

What is to be done with the Irish Church Surplus Fund?—The total charges on the Church, said Mr. Gladstone, while laying down his plan for the Irish Church disestablishment, will amount to about eight millions and a half, and leave to the State seven millions and a half. How are we to dispose of the surplus? The money must be applied to Irish purposes, but not to ecclesiastical purposes. The people must be the recipients. The proposal is to apply the surplus to charitable purposes. Lunatic Asylums cost Ireland about 140,000*l.* a-year; Deaf and Dumb Asylums and Blind Asylums are expensive in proportion to the numbers that are relieved; and the maintenance of such asylums is a purpose specially marked out for the utilization of such a surplus as that of the ecclesiastical property. Besides asylums for lunatics, blind and deaf mutes, the training of nurses, the support of infirmaries, of reformatories, and industrial schools might be provided for.

Chambered Tumulus, Brittany.—At the last meeting of the Anthropological Society, Mr. A. L. Lewis, in the course of "Reminiscences of a Visit to Locmariaker and Gavr Inis," said that Locmariaker, or "Virgin Mary's Town," stands on the site of the ancient Dariorigum, the capital of the Veneti, on the Mer de Morbihan, Brittany, and is surrounded by innumerable remains of its ancient inhabitants. One of these was a dolmen, nearly 70 ft. long, which the author believed to have been intended for sepulchral purposes. Gavr Inis, or "Goat's Island," is situated in the Morbihan sea, and is celebrated for its chambered tumulus, the chamber and gallery of which are together about 70 ft. long, 5 ft. high, and 3 ft. wide at the entrance, increasing gradually to a height and width of from 6 ft. to 8 ft. The floor and roof are formed of large flat stones, the latter being supported by twenty-seven upright stones, nearly all of which are covered with incised ornamentations, composed chiefly of segments of concentric circles, interspersed with waved lines, and resembling somewhat the Northumbrian rock-inscriptions, and those of the tumulus at New Grange, Ireland.

Herculaneum.—The exploration of Herculaneum, one of the cities buried in the great eruption of Vesuvius in A.D. 79, is to be resumed, thanks to a grant of money from King Victor Emmanuel. The researches into the tombs of this city have been interrupted for above twenty years, partly owing to the fact that it is buried much more deeply than Pompeii, and in a material much less easily excavated.

New and Gigantic Plant.—Within the last few days living specimens have been forwarded to this country from Nicaragua of one of the most gigantic plants in the vegetable kingdom. It is closely allied to the Arums (or "Lords and Ladies") of our hedges, and, until the present time, has wholly escaped the notice of travelling botanists. It produces but one leaf, nearly 14 ft. in length, supported on a stalk 10 ft. long. The stem of the flower is a foot in circumference, the spathe or flower 2 ft. long, purplish blue in colour, with a powerful carrion-like odour. As this remarkable species of Aroideæ is quite new to science, it has not yet received a name.

Dwellings for the Industrial Classes.—A meeting of gentlemen interested in providing dwellings for the higher classes of artisans, merchants', commercial, and bankers' clerks, &c., and thus supplying the need created by the construction of railways through the heart of the metropolis, has been held at the residence of the Hon. Arthur Kinnaird, M.P., Pall-mall East. The Earl of Shaftesbury presided. Mr. Habershon, the chairman of the directors of the Suburban Village Company, laid before the meeting their plans, the chief characteristic of which is, that the company proposes to build houses, and then to allot them to working men, who are to be shareholders, whose rents are, in a given number of years, to defray the cost of the dwellings, which then become their own property. The rents thus imposed he stated do not exceed those now paid for houses of a like size and character. The company have obtained a large piece of land from the Ecclesiastical Commissioners at the south-eastern extremity of Loughborough Park, Brixton. After a long discussion, a motion was carried highly laudatory of the scheme as not only advantageous to working men, but as being founded on a safe basis for those who invest their money. In the course of the meeting Lord Shaftesbury consented to lay the foundation-stone of the first block of buildings on Easter Tuesday.

Something like a Rope.—Messrs. John and Edwin Wright, Universe Works, Garrison-street, Birmingham, have just made an extraordinary rope with hemp cord and wire strands, for shipment abroad. It is 11,000 yards long, measures 5¼ in. in circumference, and weighs over 60 tons! The entire length of wire, in 60 threads, is 726,000 yards, or 412¼ miles. The length of yarn used for the centre—namely, 27 threads, is 405,000 yards, or about 230 miles. Thus there is a grand total of 1,131,000 yards, or 635 miles of material—to make up a wire and hemp rope a little under six miles long.

A Bladder in the Chimney.—A correspondent, "W. B.," writes,—"In your last issue I see a correspondent refers to a bladder being suspended in a chimney. I know of a man who had a chimney that smoked past bearing, and he was advised to suspend a bladder in the chimney, about 3 ft. from the top, and he did so. and he told me yesterday that it had never smoked since. It was an old-fashioned chimney, The bladder was suspended in the chimney the winter before this last, and it has been there ever since."

Tower Subway.—The report of the engineer, Mr. P. W. Barlow, jun., to the directors of the Tower Subway Co., was read at their general meeting on the 26th ult. It stated that the land had been so recently placed in the hands of the contractors, that there was little progress to report in the excavation of the work, but the contractor, Mr. Greathead, had arranged with Mr. Thomas Tilley to sink the shafts, and that the principal portion of the cast-iron shaft cylinders had arrived in London. Mr. Greathead had arranged with Bells, Goodman, & Co., of Newcastle, engineers, &c., to supply the castings for the tunnel. The shield for the tower side is also in course of manufacture by them. It will be constructed almost entirely of wrought iron, and fits over the iron tunnel like the lid of a telescope. The front plate has two openings, 2 ft. square in front of which the heading will be driven; it is provided with sliding doors, which may be closed instantly on the least appearance of water, thus rendering the tunnel water-tight. The lifts, it seems, are to be made for the passengers, but not for the carriages.

Architects' Benevolent Society.—Some of our readers may be glad to be reminded that the annual meeting of the society will be held in the Rooms in Conduit-street, on Wednesday, the 10th instant, at three o'clock.

The Phototype.—In *Scientific Opinion* for 24th ult., an interesting engraving from a surface block, prepared by the phototype process, is given, together with some account of that process, the details of which, however, have not yet been published. By its means, drawings, engravings, or even print, can be copied in facsimile, and printed from, in the form of surface blocks, along with types, without the necessity for employing an engraver, whose place is taken, at considerably less cost, it is stated, by the photographer. The process is not yet completely developed; but if, as *Scientific Opinion* remarks, it can do such good work in its infancy, what may we not expect from it when more matured? The engraving is both elaborate and distinct. Its subject is a magnified representation of those beautiful little organisms, the diatoms of the Arachnodiscus Japonicus order, with their concentro-radiate and elaborate structure. The magnified photograph itself, it must be understood (if any such photograph was taken), was not used in the production of the surface block (that final stage of progress, we presume, has not yet been matured): the representation of the diatoms was drawn by the late Mr. Richard Beck; so that this is a phototype direct from a drawing.

The Holborn Valley Viaduct.—At a Court of Common Council, Mr. Deputy Fry, the chairman of the Improvement Committee, in reference to the Holborn Viaduct and the improvements that are proceeding in that locality, stated that there were good grounds for believing that the Holborn Viaduct would be opened to the public in June or July next. The committee had recently examined the works, and they found that one of the principal iron girders had been fixed in its place, and there was every reason to believe that the viaduct would be opened at the time he had stated.

Norfolk and Norwich Archæological Society.—The annual meeting of the members of this society has been held at the Guildhall, Norwich, the chair being occupied by the Rev. H. Evans Lombe. On the table were some of Mr. Fitch's flints, and some engravings of the Barton turf screen, which was described by the Rev. J. Gunn. The Rev. C. R. Manning (one of the secretaries) read the report, which was adopted. Office bearers were then elected, or rather re-elected; and the skeleton of a paper prepared by the Rev. J. Bulwer and Mr. Rye on the ancient church, and on the port and trade of Cromer, was read. A little discussion took place, the Rev. J. Gunn taking the principal part in it, and afterwards reading a paper on the Barton Turf Rood-screen. A letter having been read from Canon Greenwell on the excavations at Grimes Graves, in the parish of Weeting, near Brandon, the proceedings closed.

The Rapidity and Cost of the Improvement of Paris.—In a debate of the French Legislative body on a measure by means of which Baron Haussmann wishes the Chambers to legalize what has been done, and is being done, for the improvement of Paris, M. Thiers has been exciting attention by his remarks. According to him, the improvements have been proceeding too fast, and attracting too many of the working classes to Paris; and he predicts that in 1870-71 there must be a crisis.

"Thirty years ago," said M. Thiers, "there was not a shop in Paris which was let at more than 15,000 fr. or 20,000 fr. Now there are some at 80,000 fr. or 90,000 fr. Fifteen years back a square mètre of ground cost 500 fr. or 600 fr., now the price is raised to 1,000 fr. or 1,100 fr. And provisions? The increase is enormous. You say that the workman's wages have been augmented. Doubtless; but if he receives more, does he not spend more?"

The indebtedness of the city of Paris was pretty generally known before the present debate took place. The *Débats* some time since published a statement of which the summary is, that the sums still due by the city of Paris to the various companies of contractors for the most recent works in opening new streets, and for those still in course of construction, and which payments are to be made out of the proposed loan, amount to 453,033,005 fr. To that sum must be added what has been already paid, which brings the whole up to the end of that year to 74,800,000 fr.

St. James's Tower, Taunton.—At a vestry meeting held for the purpose of considering the state of this tower, it was resolved that, provided funds can be obtained, the tower be taken down and rebuilt, and that a committee be formed to collect subscriptions. Resolutions for the repair of the tower, and for its restoration, were negatived. A committee was then appointed.

A New Fact in the Behaviour of Iron.—Mr. Gore has noticed a new fact in the behaviour of iron under the influence of heat and of strain. A strained iron wire was heated to redness by a current of voltaic electricity, and then, the current being discontinued, was allowed to cool. It was observed that there arrived a moment in the process of cooling at which the wire suddenly elongated, and then gradually shortened, until it became perfectly cold, remaining, however, permanently elongated. No other metal besides iron exhibited this peculiarity, which Mr. Gore attributes to a momentary molecular change, and he points out that this change would probably happen in large masses of wrought iron, and would come into operation in various cases where those matters are subjected to the conjoint influence of heat and strain, as in various engineering operations, the destruction of buildings by fire, and other cases. The phenomenon deserves a further investigation, since every fact relating to iron is of importance to us.—*Mechanics' Magazine.*

Making Mortar.— A correspondent from Syracuse, N.Y., sends us an account of an invention perfected in that city for mixing mortar, which is simply this:—The lime is first slacked in a vat with water enough to make it to a paste, and allowed to retain its heat for about twenty-four hours; it is next run off into a second vat, from which it is pumped by a chain pump to a revolving cylinder that has a large number of spikes on the inside. As it flows from the cylinder, it passes through a sieve of ten meshes to the inch, and every particle that is used has to go through these very fine holes no larger than a pin's head. From this machine it falls into a larger vat, from which it is pumped, as required, to a similar revolving machine, called the mixing machine, into which it flows in a continuous stream; and sand, previously sifted, is added at the rate of about eighty bushels per hour. The mortar made in this way is said to be of a very superior quality.—*Scientific American.*

Green Wood.—A new method for drying green wood in a very short time, it is said, consists in boiling it for some hours in water and leaving it then to cool, by which the soluble substances are removed. It is then boiled in an aqueous solution of borax, by which the insoluble albumen of the wood is rendered soluble, and escapes from the pores. The wood is then placed in drying-chambers, heated by steam, and allowed to remain three days. Wood thus treated is described as being more compact than it would be by ten years of ordinary exposure; as not shrinking, or warping, and as being secure against decay; on account of its greater density more easily polished; and better fitted for articles of furniture and musical instruments.

Restoration of Bath Abbey.—The groining of the nave and aisles has at length been completed, and the money required to pay for it has all been realized with the exception of about 50*l.* The committee at their last meeting gave directions for concreting the floor of the nave, and for the provision of the warming apparatus for the church. The contractor has been engaged in cleaning down and scraping the walls and pillars, and the other portions of the work will be proceeded with with convenient speed.

Public Works of Board of Works.—The Metropolitan Board of Works have issued a return showing that the following sums had been expended upon the various public works up to the 1st July, 1868:—For the main sewers and ordinary expenses, 3,178,716*l.*; Covent Garden Approach, 125,400*l.*; Southwark and Westminster Communication, 597,072*l.*; Victoria Park Approach, 43,615*l.*; Finsbury Park, 70,844*l.*; Southwark Park, 87,954*l.*; Fire Brigade, 172,482*l.*; Whitechapel Improvement, 128,520*l.*; Holborn Improvement, 67,379*l.*; Kensington Improvement, 112,532*l.*; Metropolis Main Drainage, 3,967,184*l.*; Thames Embankment (North), 1,599,052*l.*; Southern Embankment, 846,010*l.*; and for Mansion-House-street, 1,264,611*l.*

Williton Surveyor.—The office of highway surveyor for Williton having become vacant by the resignation of Mr. Williams, the Highway Board received no fewer than fifty applications for the vacancy. Out of that number two were selected, Messrs. A. Durie, surveyor, of Dunster; and a Mr. Evans, assistant surveyor, Tolladine, Worcester, the former of whom has been elected to fill the situation, at a salary of 200*l.* per annum.

New English Church at Hyeres.—A correspondent, writing from Hyères, says:—"On Wednesday last the new English church at this place was opened for public worship. There was a large congregation, and the Mayor of the town and the Juge de Paix were present. The building just opened is commodious and well-finished, and does great credit to all concerned in its erection."

Another Theatre Burnt.—The theatre of Cologne has been burnt to the ground. The man in charge of the building, with his wife and five children, perished in the flames.

Telegraphic Progress.—A telegram from Cuba states that Sir Charles Bright has succeeded in picking up the submarine cable lost during the last summer in the gulf-stream, between Florida and Havannah.

Timber under Hearth Stones. — Kendal Town-hall narrowly escaped being destroyed by fire a week ago. Under the hearth-stone of the news-room was a piece of timber, and the stone having cracked, the wood became ignited.

The Literary Fund. — Lord Stanley will preside at the ensuing anniversary dinner, Wednesday, May 5th. The general meeting for the election of officers will be held on Wednesday next, March 10th.

Bombay.—A time-ball tower has been erected here from the designs of Mr. W. J. Addis, who is the engineer to the Local Fund Works, Tanna. It has been erected under his superintendence at the cost of 17,000 rupees.

The Somerset Archæological Society.—The first *conversazione* of this society for the season has been held at Taunton, when several papers were read. There was a large attendance, including ladies. The meeting was held in the Museum, and Mr. J. Hamilton, of Fynecourt, presided.

United Service Institution.—On Friday, the 12th inst., Mr. W. Cave Thomas is to read a paper on County Military Training Schools, a suggestion for improving the recruiting system.

TENDERS.

Accepted for the erection of a chapel in Park-road, Batley, for the Christian Brethren Society. Messrs. Sheard & Hanstock, architects:—

Mason's Work.

Preston & Webster	£420 0 0

Joiner's, &c. Work.

Ibberson	549 10 0

Slater's, &c. Work.

Steers & Stocks	47 16 0

Plasterer's Work.

Kitchingman	78 10 0

Plumber's Work.

Lobley	20 0 0

Painter's Work.

Kershaw	24 0 0

Accepted for the erection of a warehouse, houses, offices, &c., at Bulrush Mills, Batley, for Messrs. Talbot, Senior, & Talbot. Messrs. Sheard and Hanstock, architects:—

Mason's Work.

Riley	£801 0 0

Joiner's, &c. Work.

Jowett	512 0 0

Ironfounder's Work.

Bagshaw	40 0 0

Plasterer's Work.

Hey	28 10 0

Plumber's Work.

Lobley	26 0 0

Slater's Work.

Riley	120 0 0

For alterations and additions to Bowater House, Hampton Court. Mr. H. H. Collins, architect:—

Dawes	£1,855 0 0
Stuart & Bennett	1,478 0 0
Alderton	1,380 0 0
Wheatley	1,369 0 0

For St. Philip's Church, Battersea. Mr. T. J. Knowles, jun., architect:—

	Total, including Spire.	Spire.
Beaver	£13,793 0 0	£794 0 0
Staines & Son	12,750 0 0	760 0 0
Baker & Constable	12,730 0 0	700 0 0
Nightingale	12,325 0 0	750 0 0
Conder	12,290 0 0	680 0 0
Hopern	12,088 0 0	600 0 0
Cooke & Green	11,675 0 0	676 0 0
Bennett	11,416 0 0	705 0 0
Dove Brothers	11,395 0 0	550 0 0
Winship	11,295 0 0	675 0 0
Manley & Rogers	10,970 0 0	670 0 0
Sawyer	10,826 0 0	780 0 0
Johnson	10,800 0 0	570 0 0
Carter & Sons	10,470 0 0	630 0 0
Colls & Son	10,340 0 0	570 0 0

Accepted for new infirmary and other additions at the Basford Union, Nottingham. Mr. S. J. Barber, of Eastwood, architect:—

Mr. G. Hopewell	£7,997 0 0

For the erection of a Wesleyan Chapel at Lewisham. Mr. John Turring, architect:—

Bishop	£4,995 0 0
Myers & Sons	4,846 0 0
Preedy & Son	4,826 0 0
Simpson	4,700 0 0
Higgs	4,658 0 0
Kilby	4,538 0 0
Saunders	4,435 0 0
Carter & Sons	4,235 0 0
Newman and Mann	4,190 0 0
Hill & Sons	4,100 0 0

For seven houses and shops in Duke-street, Brighton, forming part of the "Duke-street improvements," for Mr. John Hart. Mr. B. H. Nunn, Architect. Quantities supplied:—

Chappell	£5,984 0 0
Cheesman & Co.	5,950 0 0
Kirk	5,752 0 0
Patching & Sons	5,750 0 0
S. & W. Dancy	5,660 0 0
Bruton	5,460 0 0
Lockyer	5,459 0 0
Parsons, jun. (accepted)	5,200 0 0

For building new coffee saloon and shops in Villiers-street, Strand, for Mr. C. Gatti. Mr. Bolton, architect:—

Mills	£3,980 0 0
Hill & Son	2,875 0 0
Nixon	2,848 0 0
Sharpington & Cole	2,797 0 0
Clemence	2,788 0 0
Ward	2,297 0 0
Carter & Sons	2,200 0 0

For works at Hanninghold and Blasten. Mr. R. W. Johnson, architect:—

Herbert	£1,860 0 0
Neale & Sons	1,843 0 0
Fast	1,832 0 0
Halliday & Cane	1,824 0 0

For villa residence, West Cowes, Isle of Wight. Mr. R. W. Johnson, architect:—

Chinchin	£5,400 0 0
Ball	4,780 0 0
Wheeler	4,870 0 0
Thomas	4,597 0 0

For six cottages at Kettering, Northamptonshire. Mr. R. W. Johnson, architect:—

Bellamy	£812 0 0
Wilson	693 0 0
Hawthorn	690 0 0
Margetts	683 0 0
Sharman	664 0 0
Barlow	651 0 0
J. & G. Henson	644 0 0

For five houses and shops in the Fulham-road, Chelsea, for Mr. H. G. Renshaw. Mr. Lacy W. Ridge, architect. Quantities supplied by Mr. L. C. Riddett:—

Gammon & Sons	£7,304 0 0
Richardson	6,995 0 0
Williams & Son	6,967 0 0
Webb & Sons	6,750 0 0
Macey	6,744 0 0
Adamson & Sons	6,625 0 0
Foster	6,560 0 0
Scrivener & White	6,283 0 0

For new church at Webheath, Bromsgrove, for the Right Hon. the Baroness Windsor. Stone principally given. Mr. Frederick Preedy, architect. Quantities furnished by Messrs. Goodman & Vinall:—

Clark & Smallwood	£2,625 0 0
Whateley	2,479 16 0
Espley	2,351 8 6
Jones	2,343 10 0
Field	2,217 0 0
Nelson	2,062 0 0
M'Cann & Everal (accepted)	2,019 10 0

For rebuilding chancel and restoring the parish church of Kettlestone, Norfolk. Mr. Frederick Preedy, architect:—

Turner & Sons	£1,203 19 0
Brown	1,009 0 0
Cornish	1,008 7 0
Bardell & Son (accepted)	921 10 0

For building four shops, &c., at Hounslow. Mr. J. Holmes, architect. Quantities not supplied:—

Westcombe	£2,400 0 0
Pearman	2,378 0 0
Hiscock	2,360 0 0
Bransden (accepted, subject to alterations)	2,265 0 0

For the erection of a house and shop, for Mr. A. Baker, Sudbury, Suffolk. Mr. T. F. Ray, architect. Quantities not supplied:—

		Allow for old buildings.
Sudbury & Son	£2,726 4 6	£72 0 0
Holland	2,243 15 6	—
Grimwood & Son	2,200 0 0	—
Halls	1,614 0 0	53 0 0

TO CORRESPONDENTS.

G. S.—W. B.—W. J. A.—E. H. N.—C. G.—R. W. J.—S. W.—Z.—T. G.—S. & C.—S. C.—J. J.—A. G.—R. J.—J. G. E.—J. T.—Mr. P.—J. T.—J. L.—C. L.—C. F. H.—L. W. R.—A. & C. H.—Mr. L.—W. J.—R. W. E.—S. J. B.—T. B.—R. & C.—F. T. M.—A Subscriber.—L. S.—M. A. B.—R. & R.—H. P. H.—G. F.—W. C. T.—J. T.—Dr. M.—M. A. H.—J. A. R.—E. I'A.—T. D.—R. T.—F. & Co.—J. T. P.—W. S.—E. C. R. H. A.—W. G. S.—R. B.—A. M.—J. M. G.—W. L. (under the mark).—C. B. (send particulars of the case).—S. R. R. (next week).—T. J. H. (next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

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